

ANRITSU

MH676A

Multiplexer

MH677A

Demultiplexer

SERVICE MANUAL

SERVICE MANUAL
MULTIPLIER
MH676A
DEMULTIPLIER
MH677A

CERTIFICATION

ANRITSU CORPORATION certifies that this instrument has been thoroughly tested and inspected, and found to meet published specifications prior to shipping.

Anritsu further certifies that its calibration measurements are based on the Japanese Electrotechnical Laboratory and Radio Research Laboratory standards.

WARRANTY

All parts of this product are warranted by Anritsu Corporation of Japan against defects in material or workmanship for a period of one year from the date of delivery. In the event of a defect occurring during the warranty period, Anritsu Corporation will repair or replace this product within a reasonable period of time after notification, free-of-charge, provided that: it is returned to Anritsu; has not been misused; has not been damaged by an act of God; and that the user has followed the instructions in the operation manual.

Any unauthorized modification, repair, or attempt to repair, will render this warranty void.

This warranty is effective only for the original purchaser of this product and is not transferable if it is resold.

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All requests for repair or replacement under this warranty must be made as soon as possible after the defect has been noticed and must be directed to Anritsu Corporation or its representative in your area.

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ERRATA

DESCRIPTION		ITEM
CORRECT	ERROR	PARTS LIST
Battery with resistor, (S49Z10069E)	Battery, (ER-6)	

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SECTION 1

GENERAL

This is the Service Manual for the MH676A and MH677A. It covers the following information:

SECTION 2 MECHANICAL CONFIGURATION:

Describes how the various printed circuit boards (PC boards) are laid out.

SECTION 3 TROUBLESHOOTING AND ADJUSTMENT

Describes how to troubleshoot the equipment. Circuit diagrams for the MH676A and MH677A are given in this section.

SECTION 4 REPLACEMENT PARTS:

Explains how to order replacement parts and gives the parts lists.

For specifications, operating instructions, performance check, and a detailed panel control description of the MH676A and MH677A, refer to the separate operation manual.

SECTION 2

MECHANICAL CONFIGURATION

2.1 MH676A and MH677A Disassembly

Figure 2-1 and 2-2 show the disassembly of the MH676A and MH677A.

(1) Top cover (2) removal

Remove the six screws (4).

Then, remove the top cover (2).

(2) Board clamp (3) removal

Remove the three screws (5).

Then, remove the board clamp (3).

2-1/(2-2 blank)

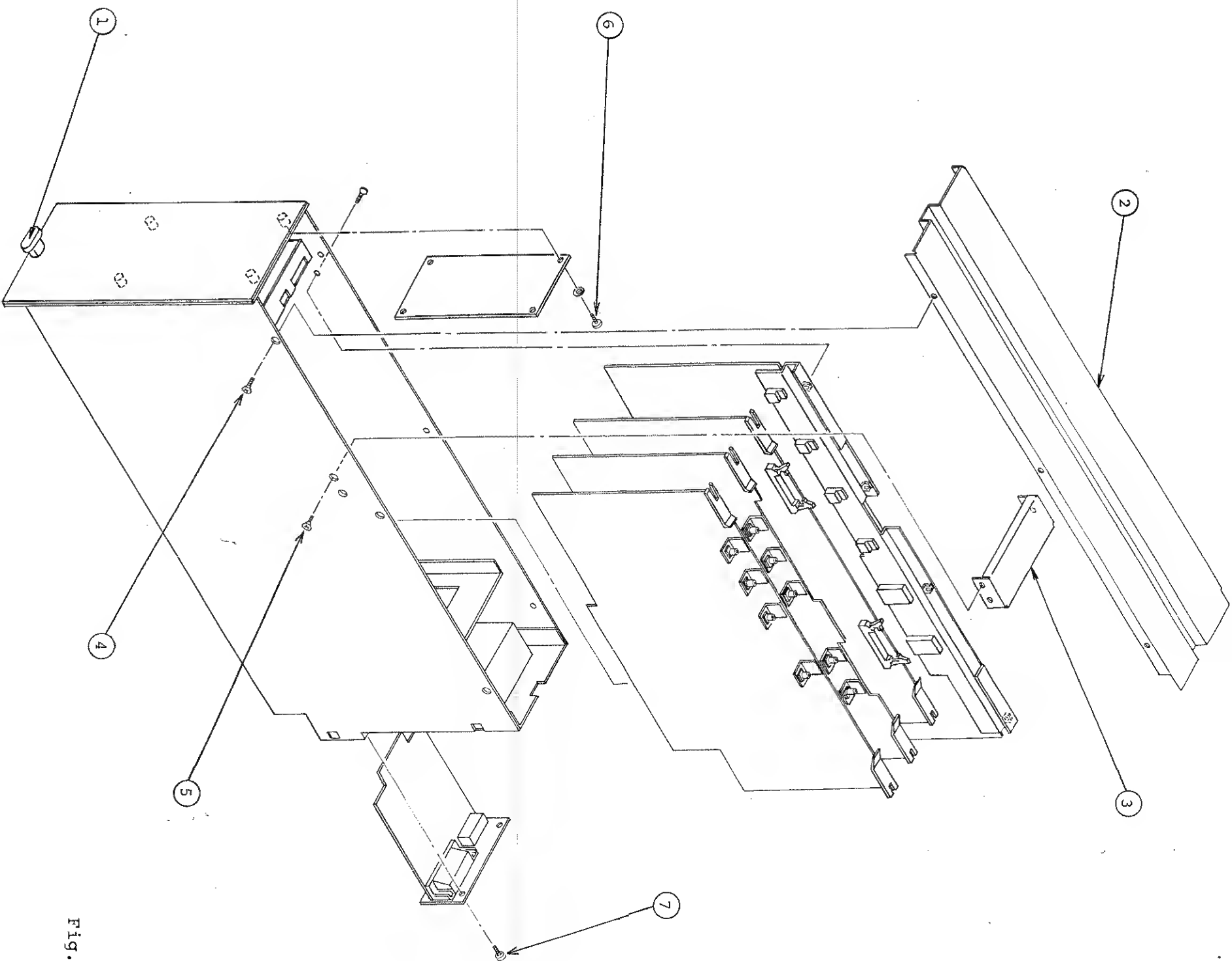


Fig. 2-1 MH676A Disassembly

NO.	PARTS NO.	DESCRIPTION	REMARKS	Q'TY
1	44B55948	Knob		1
2	432B33632	Cover		1
3	442B84978	Board clamp		1
4	2.6FPS6B3	Screw		6
5	3FPS8B3	Screw		7
6	3NPS6B3 + SW	Screw		4
7	3BPS8S3 + WBS	Screw		4

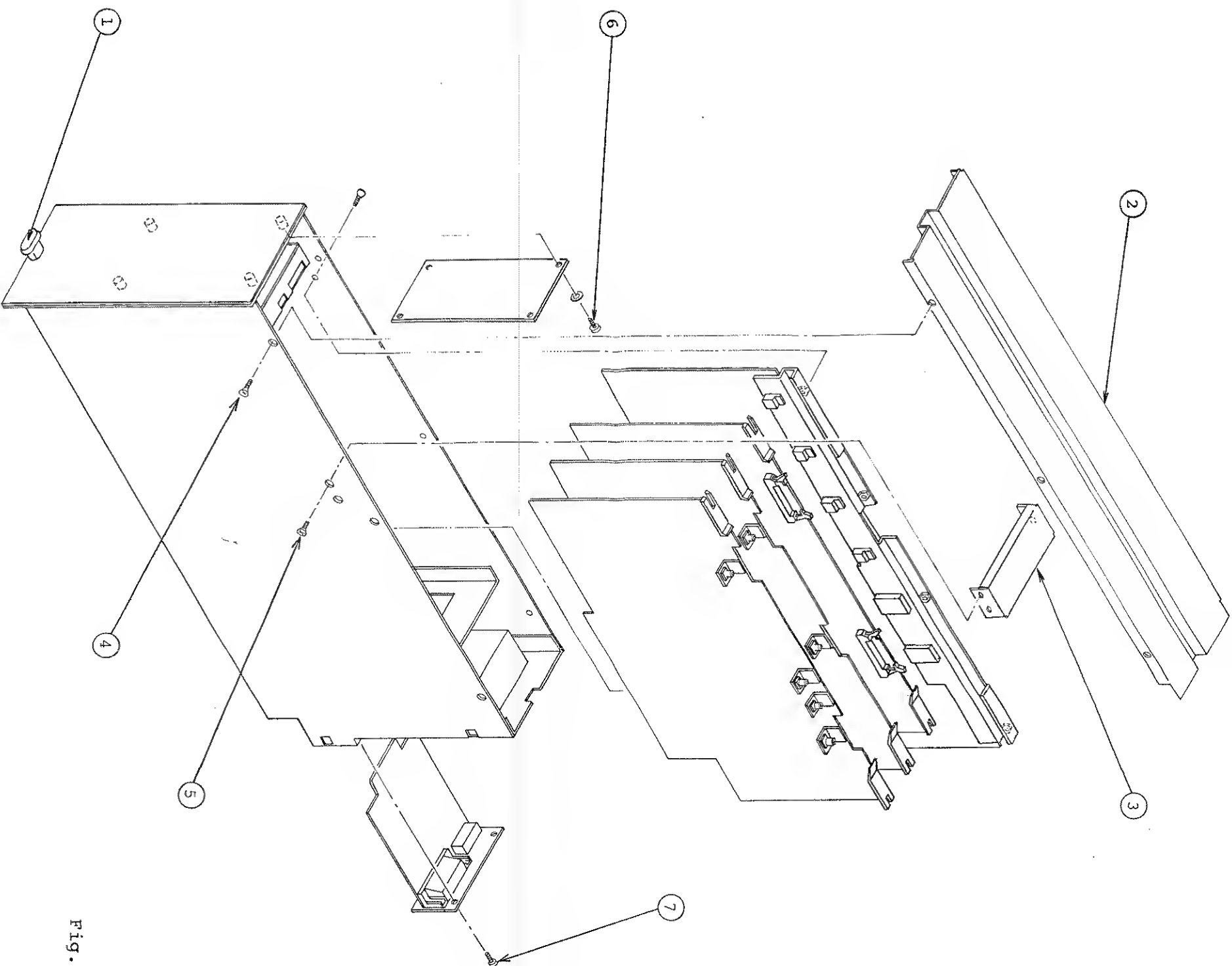


Fig. 2-2 MH677A Disassembly

NO.	PARTS NO.	DESCRIPTION	REMARKS	Q'TY
1	44B5594B	Knob		1
2	432B33632	Cover		1
3	442B84978	Board clamp		1
4	2.6FPS6B3	Screw		6
5	3FPS8B3	Screw		7
6	3NPS6B3 + SW	Screw		4
7	3BPS8S3 + MBS	Screw		4

2.2 MH676A and MH677A Internal Views

Figure 2-3 and 2-4 show the internal views of the MH676A and MH677A.

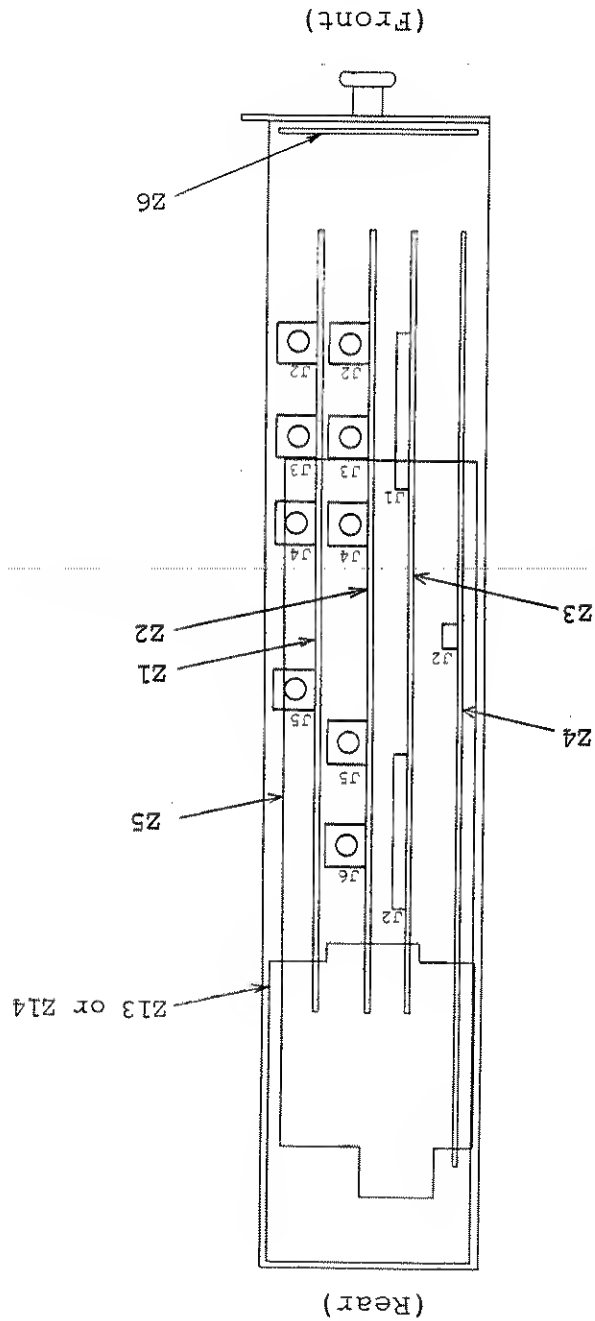
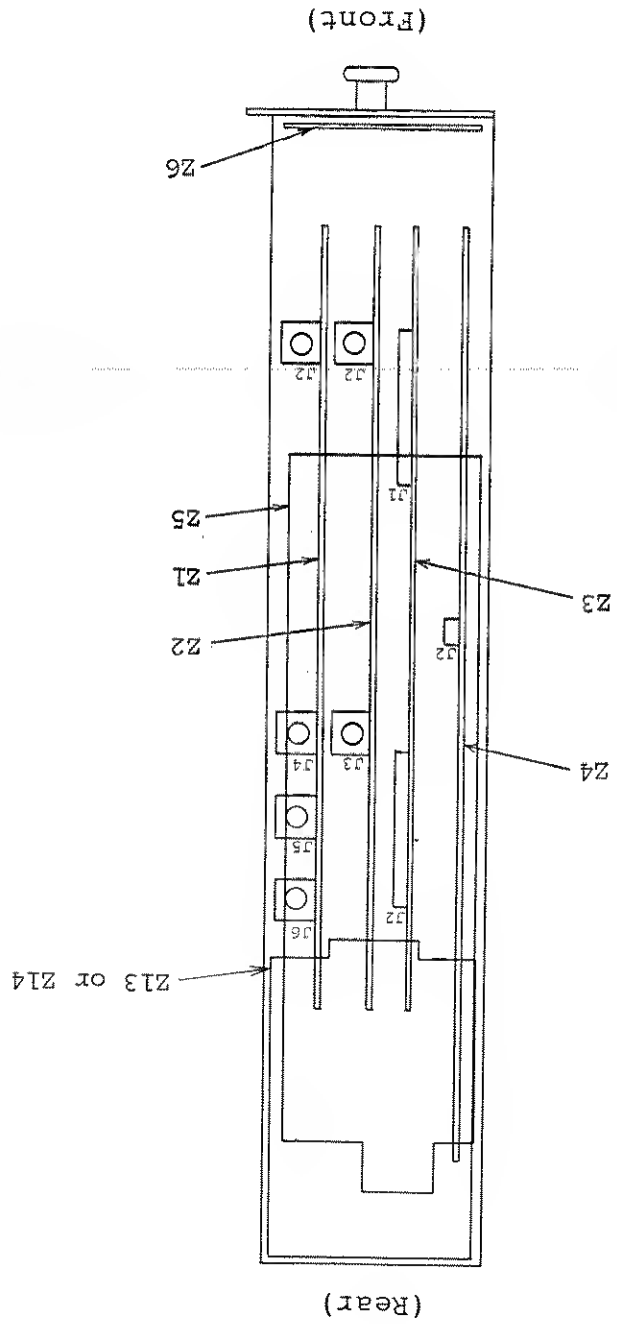


Fig. 2-3 MH676A Top View

Fig. 2-4 MH677A Top View



SECTION 3

TROUBLESHOOTING AND ADJUSTMENTS

3.1 Introduction

SECTION 3 describes how to troubleshoot and adjust the instrument when trouble occurs during measurement or when abnormalities are detected during performance checks of the operation.

This section also explains checking and replacement of parts, principles of operation (providing details on circuits), and the tools necessary to make repairs and adjustments.

Troubleshooting can be diagrammed as follows.

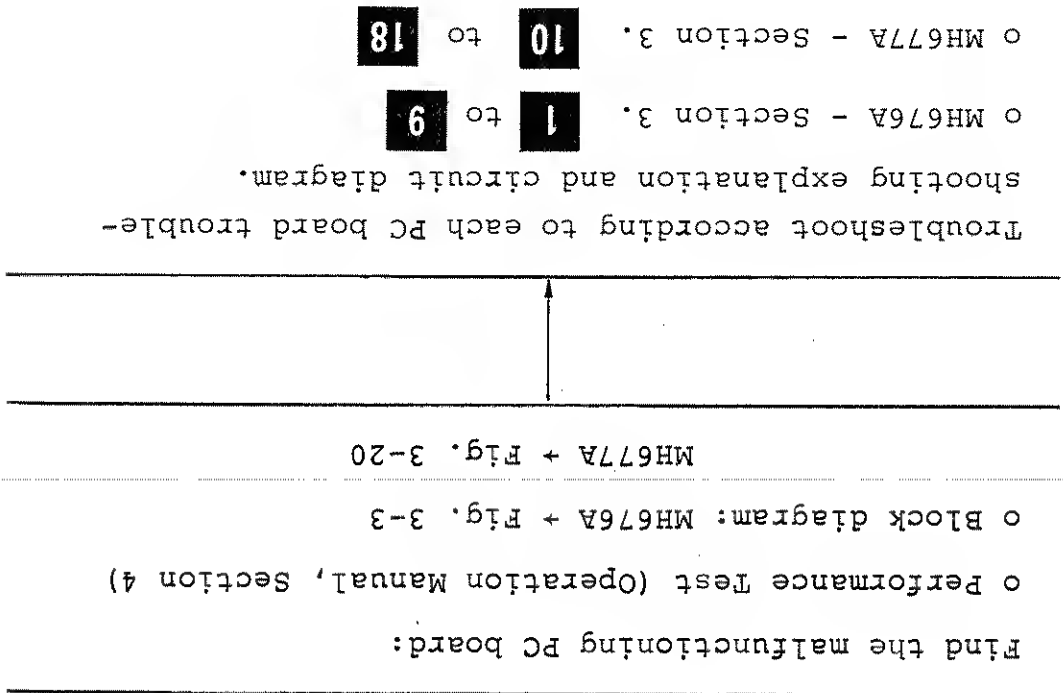


Fig. 3-1 Troubleshooting Procedure

3.2 Checking and Replacing Parts

3.2.1 Explanation of identification markings on PC boards

As shown in Fig. 3-2, the MH676A and MH677A PC boards have a unified ASSEMBLY number, DRAWING number, and REVISION number.

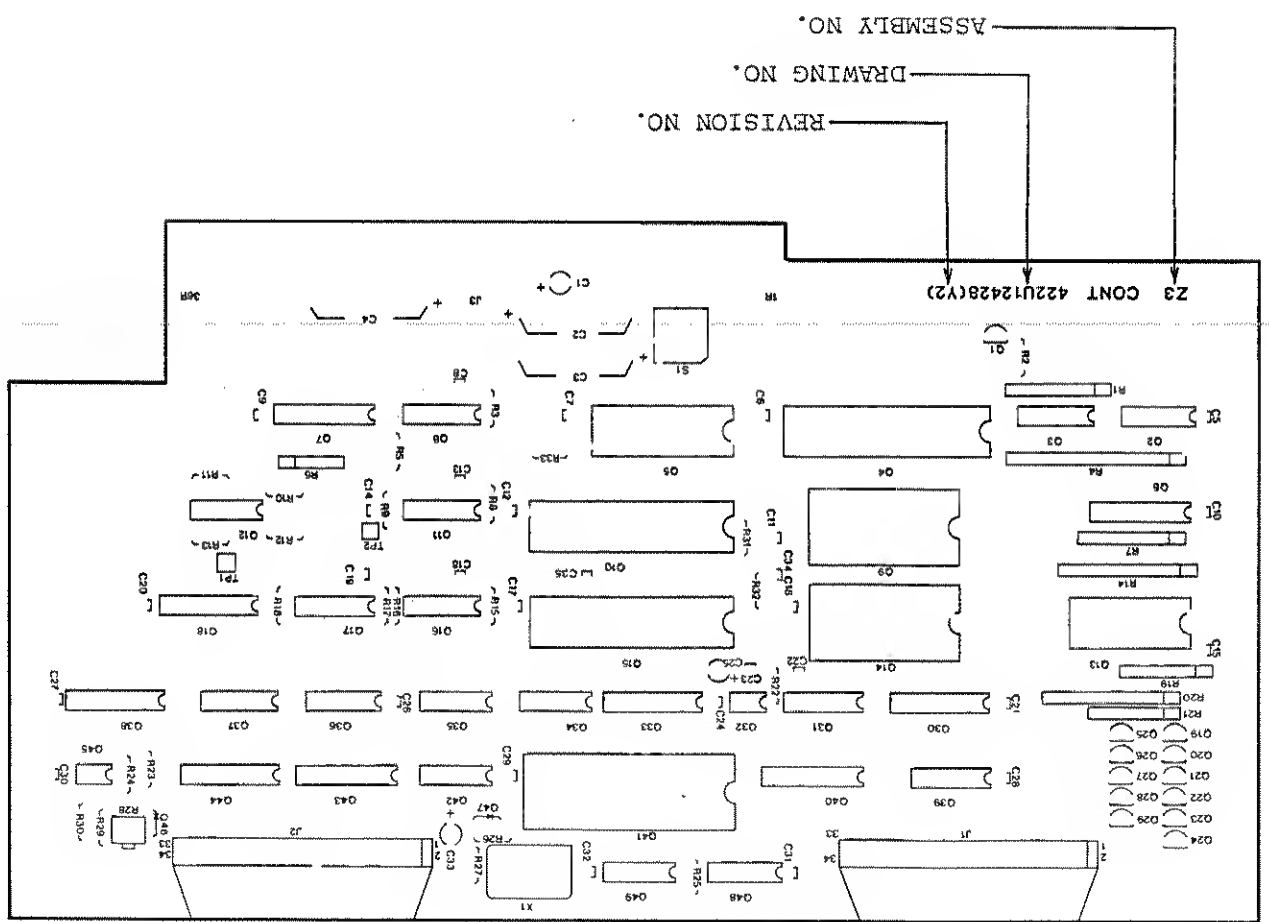


Fig. 3-2 PC Board Markings

3.2.2 Notes on Soldering

- (1) Use an ordinary 30- to 40-watt pencil-type soldering iron.

- (2) Before using the soldering iron, be sure it is electrically insulated. If it is not, it may damage the part.

- (3) When removing a soldered part from a circuit board or soldering in a new part, nip the part lead with tweezers to shunt heat.

- (4) The tips of major part leads are bent behind the PC board to ensure tight support. To remove a part, first lift up the tips of the leads and then remove the part.

- (5) When soldering a chip part (capacitance or resistance chip with no lead), use 310°C for one to four seconds.

3.2.3 Transistor checks

- (1) Mounted on PC board

Transistors can be checked for correct operation by measuring the base and emitter potentials. The NPN-type silicon transistor has a base potential 0.6 or 0.7 V higher than the emitter potential. In the PNP silicon transistor, the former is 0.6 or 0.7 V lower than the latter. Transistors are faulty if these relationships are not satisfied.

- (2) Removed from PC board

Transistors can be checked by measuring the resistance values among the emitter, base, and collector using a circuit tester. Standard values are given in Table 3-1. Note that the measuring current should be less than 100 μ A.

Table 3-1 Unmounted Transistor Lead Resistances

Type of Transistor	Circuit Tested		Measured resistance
	Positive lead to	Negative lead to	
PNP silicon	Emitter, Collector	Base	1 to 10 k Ω
	Emitter	Collector	Very high
NPN silicon	Base	Emitter, Collector	1 to 10 k Ω
	Emitter	Collector	Very high

3.2.4 Field effect transistor (FET) handling notes

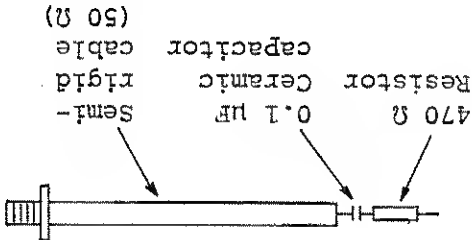
The FET in this device is used for high-speed switching because the withstand voltages between the gate and source, and drain and source are as low as approx. 5 V. Therefore, do not subject the FET to static electric discharges.

Before checking the FET and its peripheral circuits, make sure that you, the device, and all other measuring equipment being used are grounded (to earth potential) to prevent static electricity buildup.

Although the impedances of the FET between the gate and drain, and gate and source are very high (more than several hundred k Ω), the impedance between the drain and source is only several ohms.

Table 3-2 Recommended Test Equipment

No.	Name (Recommended Type)	Major Specification Required
1	Sampling Oscilloscope	Frequency: Dc to 10 GHz
2	Synthescope	Frequency: Dc to 50 MHz
3	Dc Voltmeter	Range : to 40 V Resolution: 0.01 V
4	Probe	Frequency : 1 MHz to 3 GHz



5	Extender PC board	Connect this board to the motherboard for PC board troubleshooting (Qty. 2)
6	Conversion connector	BNC-P + SMA-J (Qty. 3)
7	1 m Coaxial cable	SMA(P) [RG58A/U] SMA(P) (Qty. 3)
8	0.5 m Coaxial cable	SMA(P) [RG58A/U] SMA(P) (Qty. 2)

3.4 Circuit References

The MH676A, MH677A PC boards have reference assembly numbers called Z numbers (Fig. 3-2) Tables 3-3 and 3-4 list the Z numbers, circuit diagram names, PC board drawing numbers, and parts list numbers. The SCHEMATIC Nos. are the numbers of the circuit diagrams shown in this section. Parts lists are given in SECTION 4.

Table 3-3 MH676A Circuit References

SCHEMATIC No.	Circuit Diagram Name	Z No.	PC Board Drawing No.	Parts List No.
1	MH676A			44W83349
2	MOTHERBOARD	Z5	422U12432	44W83354
3	POWER SUPPLY	Z4	422U12430	44W83353
4	CONTROL	Z3	422U12428	44W83352
5	MUX INPUT	Z2	442U12426	44W83351
6	MUX OUTPUT	Z1	422U12424	44W83350
7	DISPLAY	Z6	432U33604	44W83355
8	GP-IB	Z13	442U83054	44W83046
9	RS-232C	Z14	442U83056	44W83047

Table 3-4 MH676A Circuit References

SCHEMATIC No.	Circuit Diagram Name	Z No.	PC Board Drawing No.	Parts List No.
10	MH677A			44W83356
11 *	MOTHERBOARD	Z5	422U12432	44W83354
12 *	POWER SUPPLY	Z4	422U12430	44W83353
13 *	CONTROL	Z3	422U12428	44W83352
14	CLOCK DELAY	Z2	422U12498	44W83358
15	DEMUX	Z1	422U12496	44W83357
16	DISPLAY	Z6	432U33606	44W83360
17 *	GP-IB	Z13	442U83054	44W83046
18 *	RS-232C	Z14	442U83056	44W83047

* Same as MH676A

3.5 MH676A Troubleshooting

Figure 3-3 shows the MH676A block diagram, consisting of PC boards Z1 to Z6, and Z13 or Z14 (listed in Table 3-3). The functions of the PC boards are outlined below. See paragraphs 3.5.1 to 3.5.6 for more details.

(1) Motherboard circuit (Z5)

The motherboard circuit receives dc power from the ME522A Transmitter and supplies the power supply circuit (Z4). It also transfers power and control signals between PC boards Z1 to Z3.

The display circuit displays the switch operation states and the AMPLITUDE and OFFSET levels according to control signals received from the control circuit.

(6) Display circuit (Z6)

The multiplexer output circuit receives DATA and CLOCK signals from the multiplexer input circuit, shapes the waveform, and changes the data format (NRZ/RZ). The signals are then output at variable AMPLITUDE and OFFSET levels.

(5) Multiplexer output circuit (Z1)

The multiplexer input circuit receives DATA1 and DATA2, and CLOCK signals from the transmitter and doubles their speeds.

(4) Multiplexer input circuit (Z2)

This circuit also receives signals from the GP-IB or RS-232C circuit (Z13 or Z14) and converts them into control signals.

The AMPLITUDE and OFFSET levels are set for output and display signals are generated.

The control circuit receives switch operation signals from the display circuit (Z6) and converts them into control signals.

(3) Control circuit (Z3)

The power supply circuit generates various dc power voltages from the power received from the MB522A Transmitter via the motherboard, and supplies the other PC boards.

(2) Power supply circuit (Z4)

(7) GP-IB circuit (Z13) or RS-232C circuit (Z14)
The GP-IB or RS-232C circuit receives signals
from an external controller and converts them into
interface signals for the control circuit.
Note:
See SECTION 2 for the mechanical configuration
required for troubleshooting.

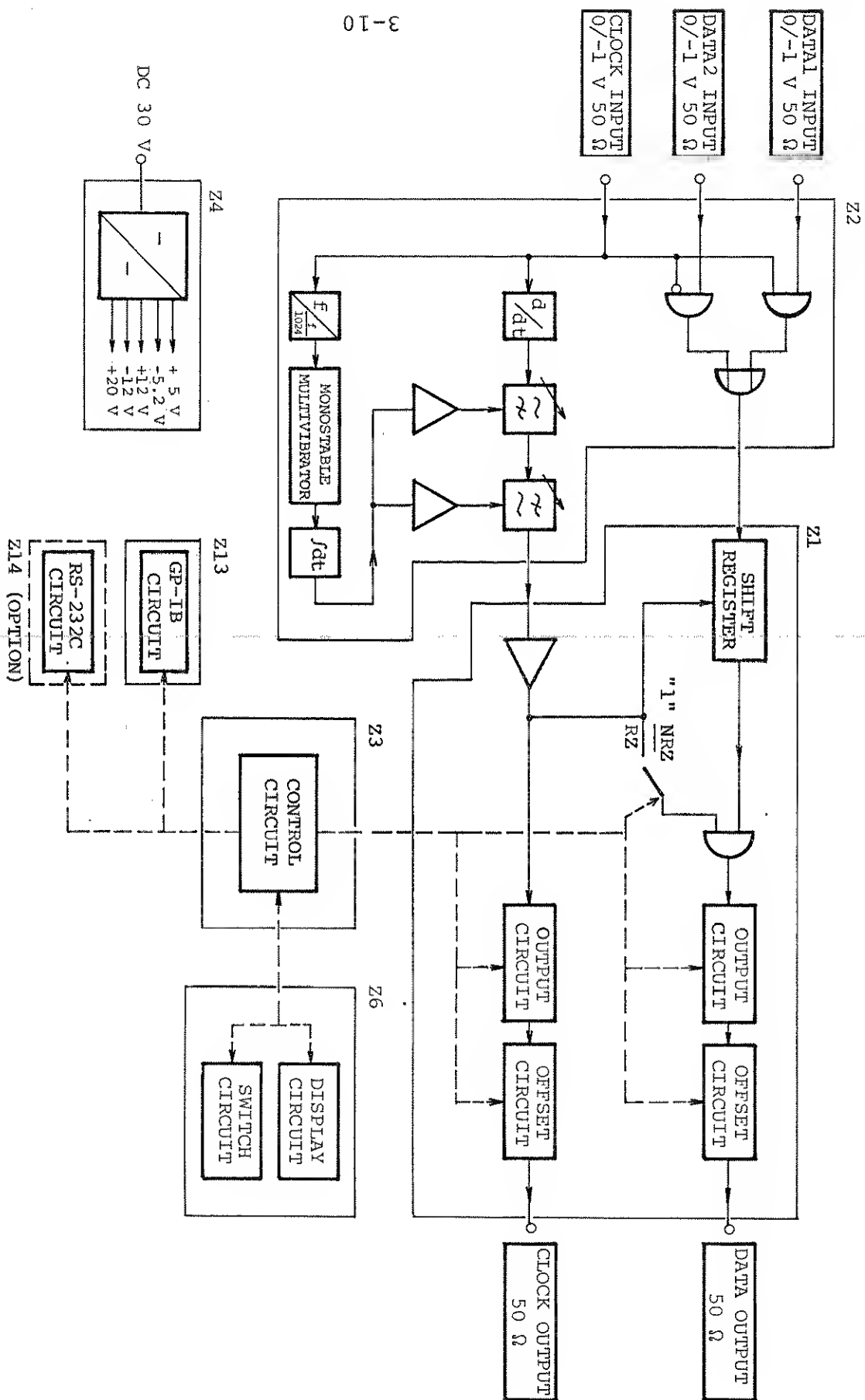
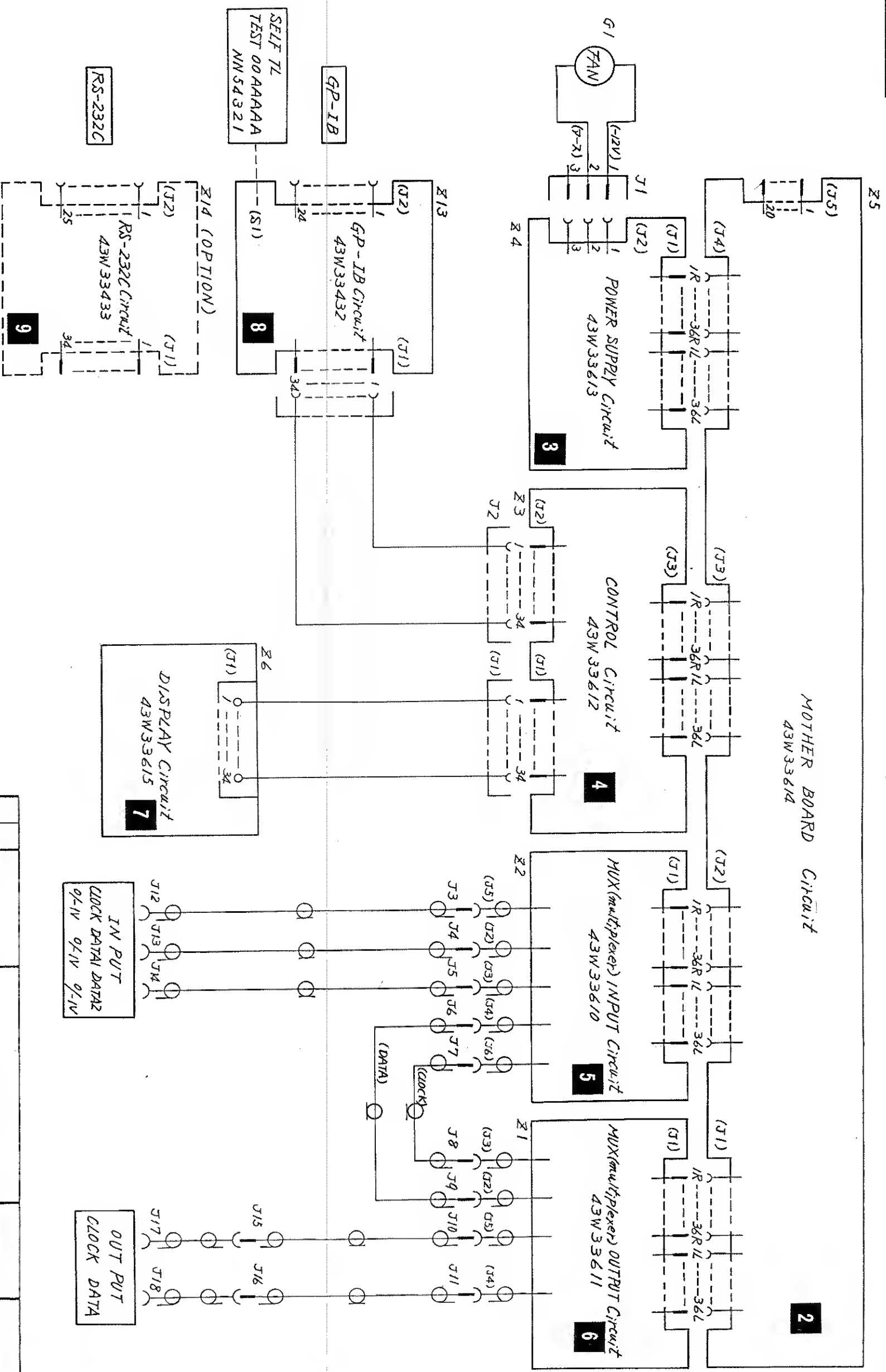


Fig. 3-3 MH676A MULTIPLEXER Block Diagram

DEP

QTY	ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY		TRACED BY		SCALE		
APPROVED BY		DRAWN BY		:		
1						

Parts List	44W83349
------------	----------

<p>TITLE</p> <p>MULTIPLER (MUX) MH676A</p> <p>Circuit Diagram</p>	<p>DRAWING NO.</p> <p>43W33609 1/1</p>
--	---

No. 0023-1985.08

43W33609 1/1

2

3

4

57

9

7



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3-11/3-12

3-13/(3-14 blank)

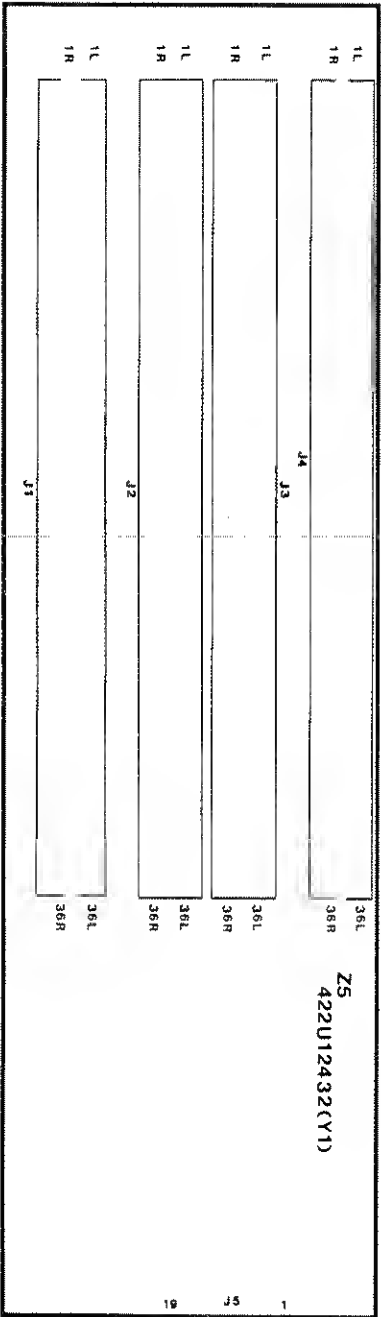
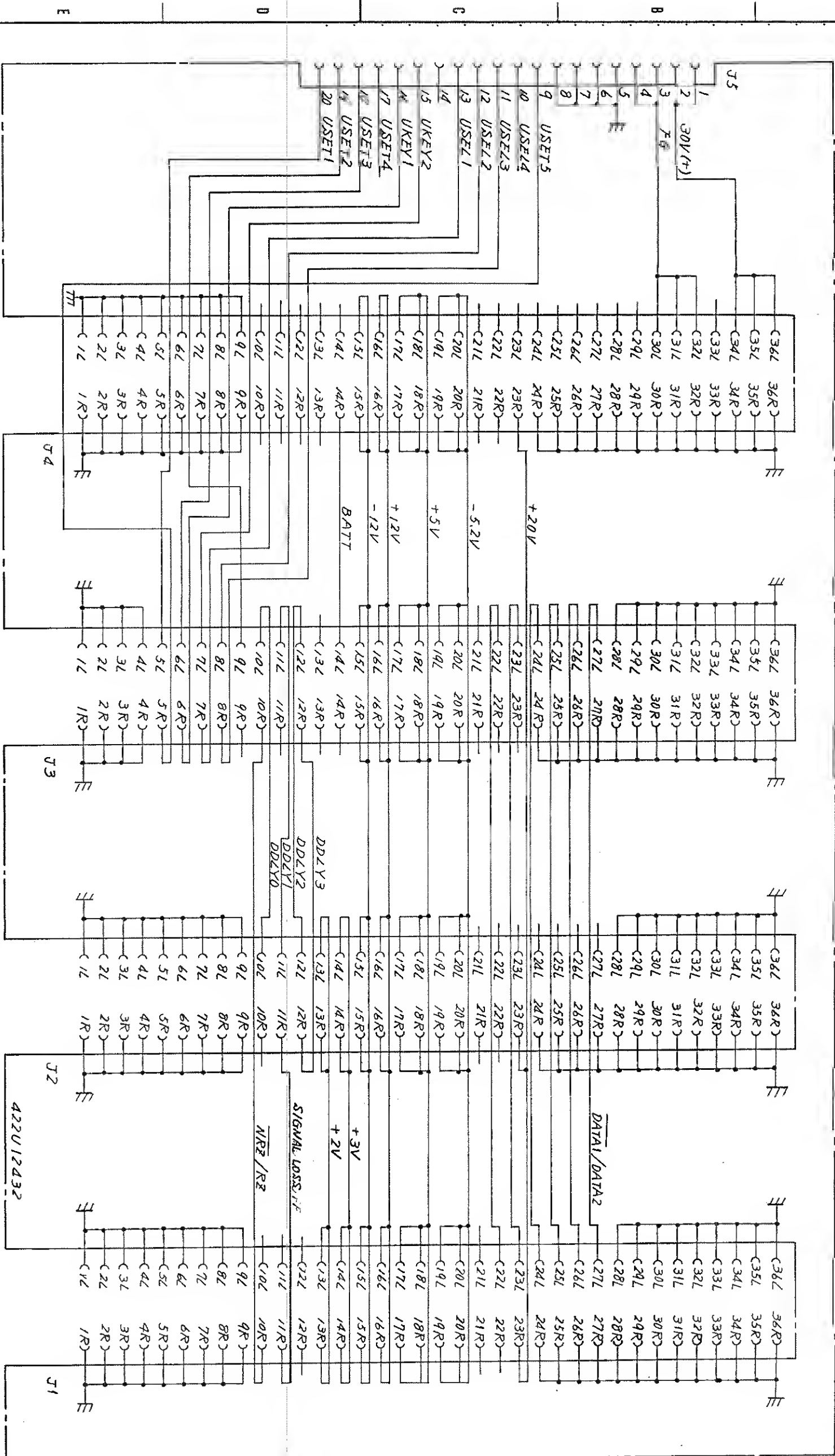


Fig. 3-4 Parts Layout of Z5 Motherboard PC Board **2**

APPLICATION

REVISIONS



POWER SUPPLY

CONTROL

MUX INPUT or CLOCK DELAY

MUX OUTPUT or DEMUX

DEP

Parts List 44W03354

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH
	CHECKED BY		TRACED BY	SCALE	
	APPROVED BY		DRAWN BY		
TITLE			DRAWING No.		
Z5 MOTHER BOARD Circuit Diagram			43W33614		

2

No. 0023-1985.08

43W33614 1/1

2

3

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8



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3-15/3-16

(1) Fuse replacement

Pull the MH676A out from the ME522A Transmitter and remove the top cover according to the instructions given in paragraph 2.1.

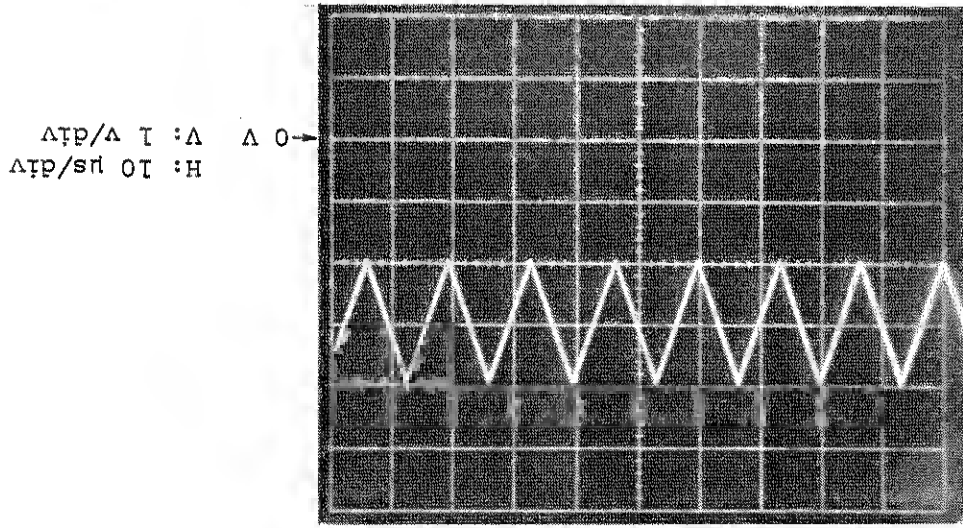
Remove fuses F1 to F5 from the fuse holder on the Z4 PC board and replace them with new fuses (Fig. 3-4).

(2) Troubleshooting

- (a) Disconnect J2 to J11 of the MH676A from J2 to J4 of PC board Z1, Z2 to J6 of PC board Z2 and J1 and J2 of PC board Z3.
- (b) Disconnect PC boards Z1 to Z3 from J1 to J3 of PC board Z5.
- (c) Remove the PC board Z4 and insert the extender board into where PC board Z4 was mounted. Then connect Z3 to the extender board.
- (d) Use a dc voltmeter to check that the voltage between Z4 test point ① and the frame ground is 35 to 50 V. If the voltage is within this range, go to the next step. If the voltage is abnormal, troubleshoot the circuit related to Z4 ① and F9 of the ME522A Transmitter power supply circuit (43W33419 2/2). (Refer to the ME522A service manual.)
- (e) Use the dc voltmeter to check that the voltage between Z4 test point ② and the frame ground is 12 to 15 V. If the voltage is within this range, go to the next step. If the voltage is abnormal, troubleshoot the circuit related to Z4 ②.

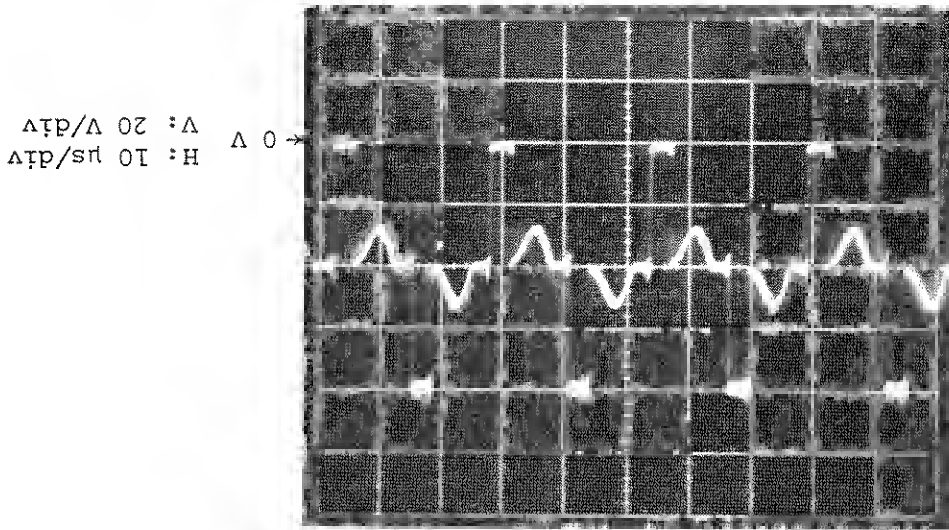
- (g) Use an oscilloscope with probe to check the waveform between Z4 test points ④ or ⑤ and the frame ground ⑥. Figure 3-6 shows the normal waveform. If the waveform is abnormal, go to the next step. If the waveform is abnormal, troubleshoot the circuits related to Z4 ④ and ⑤.

Fig. 3-5 Waveform at MH676A Z4 Test Point ③



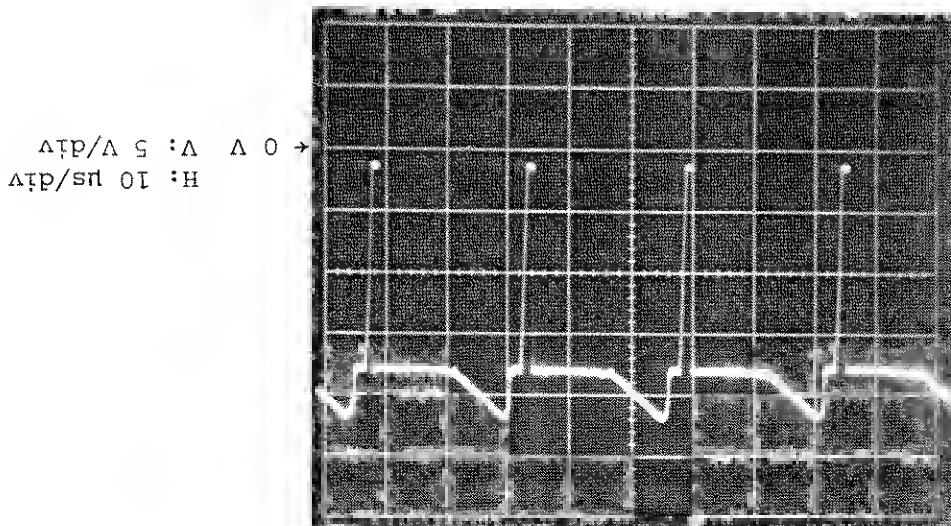
- (f) Use an oscilloscope with probe to check the waveform between Z4 test point ③ and the frame ground ⑥. Figure 3-5 shows the normal waveform. If the waveform is normal, go to the next step. If the waveform is abnormal, troubleshoot the circuit related to Z4 ③.

Fig. 3-7 Waveform at MH676A Z4 Test Point ⑥



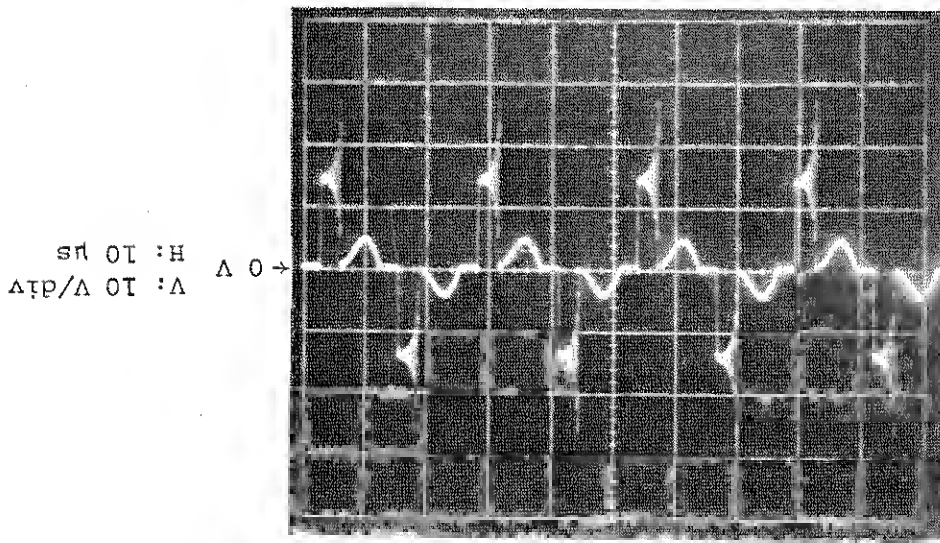
(h) Use an oscilloscope with probe to check the waveform between Z4 test point ⑥ and the frame ground ⑤. Figure 3-7 shows the normal waveform. If the waveform is normal, go to the next step. If the waveform is abnormal, trouble-shoot the circuit related to Z4 ⑥.

Fig. 3-6 Waveform at MH676A Z4 Test Points ④ or ⑤



(j) Use the dc voltmeter to check that the voltage between Z4 test point ⑨ and ground (G) ⑭ is -5.15 to -5.25 V. If the voltage is within this range, go to the next step. If the voltage is abnormal, adjust R6 until the voltage between Z4 test point ⑨ and ground (G) ⑭ is -5.2 V. If the voltage cannot be corrected, trouble-shoot the circuits related to Z4 ⑦ to ⑨ and R6.

Fig. 3-8 Waveform at MH676A Z4 Test Point ⑦



(i) Use an oscilloscope with probe to check the waveform between Z4 test point ⑦ and the ground ⑭. Figure 3-8 shows the normal waveform. If the waveform is normal, go to the next step. If the waveform is abnormal, troubleshoot the circuit related to Z4 ⑦.

The above table lists the normal values. If the voltage is not within these ranges, troubleshoot the circuits from T3 to 8, 10, 11, 12 and near the test point 6.

8	+5.5 V to +6.5 V
10	+11 V to +13 V
11	-11 V to -13 V
12	+18.5 to +20.5 V
13	+3.2 to +4 V

Table 3-5 Voltages at Test Points 8 and 10 to 13

(k) Use the dc voltmeter to check the voltage between 8, 10, 11, 12, 13 and ground (G) 12.

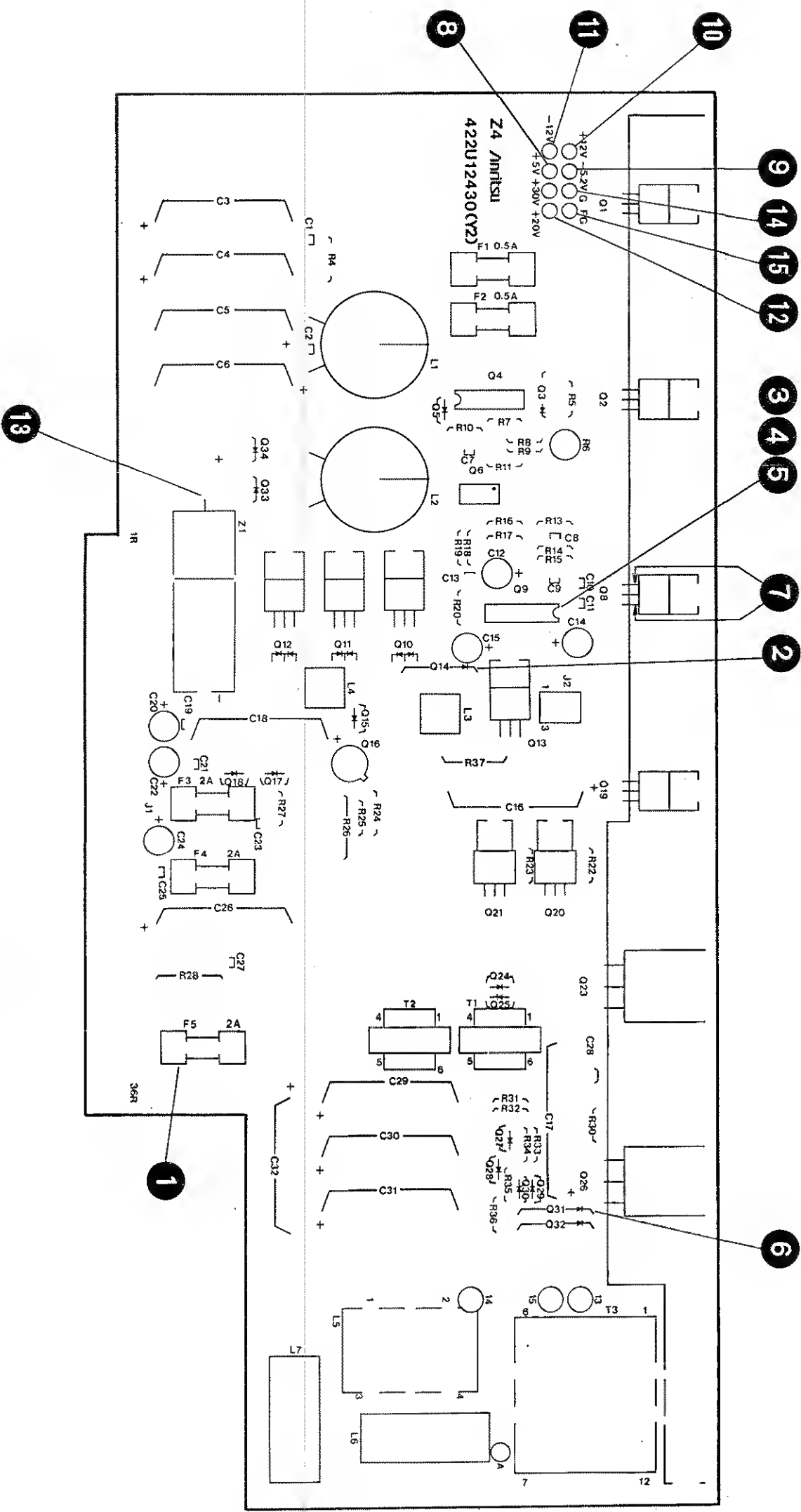


Fig. 3-9
 Parts Layout of MH676A Z4
 Power Supply PC Board 3
 3-23/(3-24 blank)

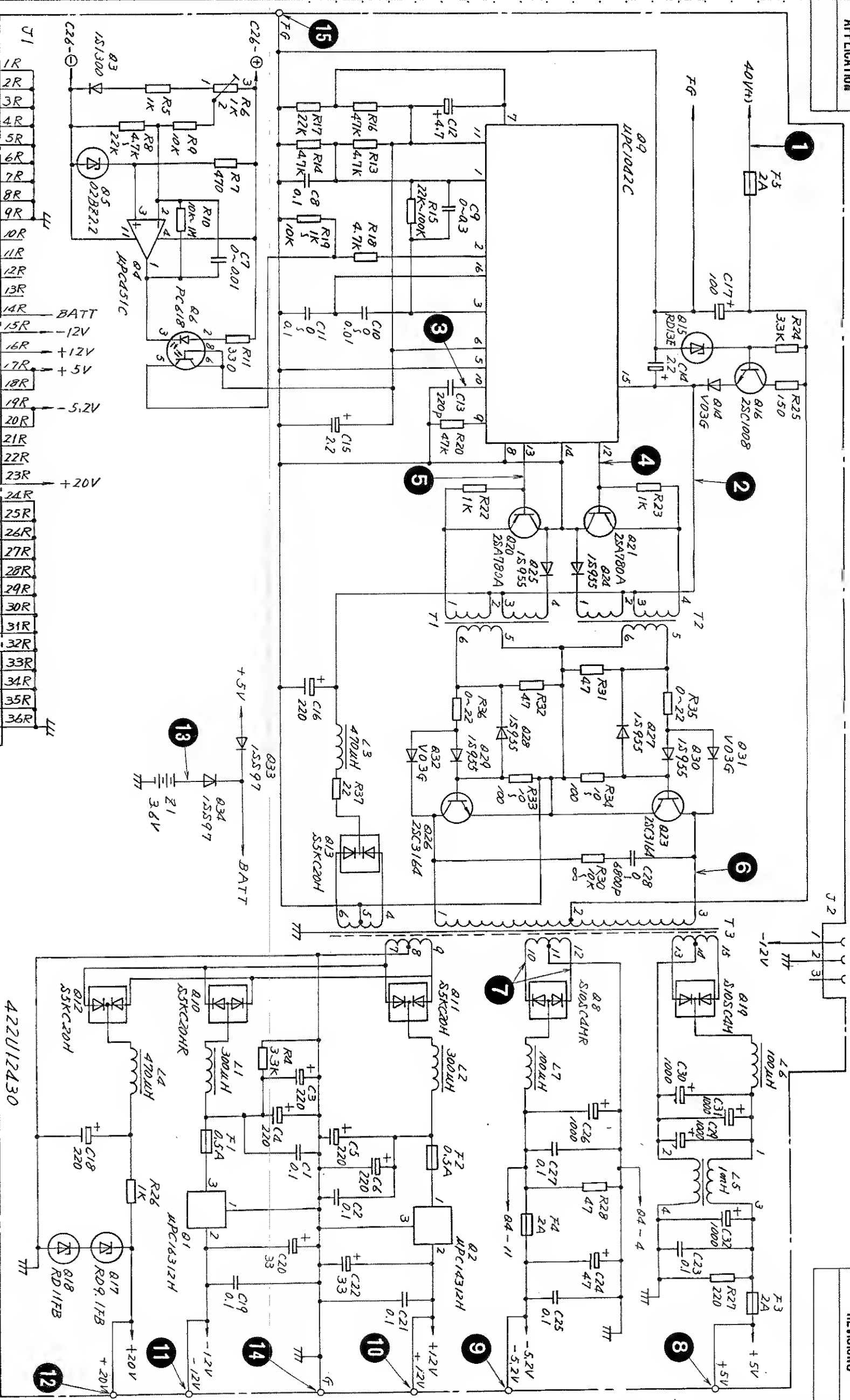


Diagram of a 36-point scale with handwritten labels from 1L to 36L. The scale is represented by a vertical line with horizontal tick marks. Labels are placed to the right of the line. Some labels are underlined. A vertical line on the left has a downward arrow and is labeled '100' at the bottom. A vertical line on the right has an upward arrow and is labeled '0' at the top.

Label	Position (approx. %)
1L	100
2L	95
3L	90
4L	85
5L	80
6L	75
7L	70
8L	65
9L	60
10L	55
11L	50
12L	45
13L	40
14L	35
15L	30
16L	25
17L	20
18L	15
19L	10
20L	5
21L	0
22L	0
23L	0
24L	0
25L	0
26L	0
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31L	0
32L	0
33L	0
34L	0
35L	0
36L	0

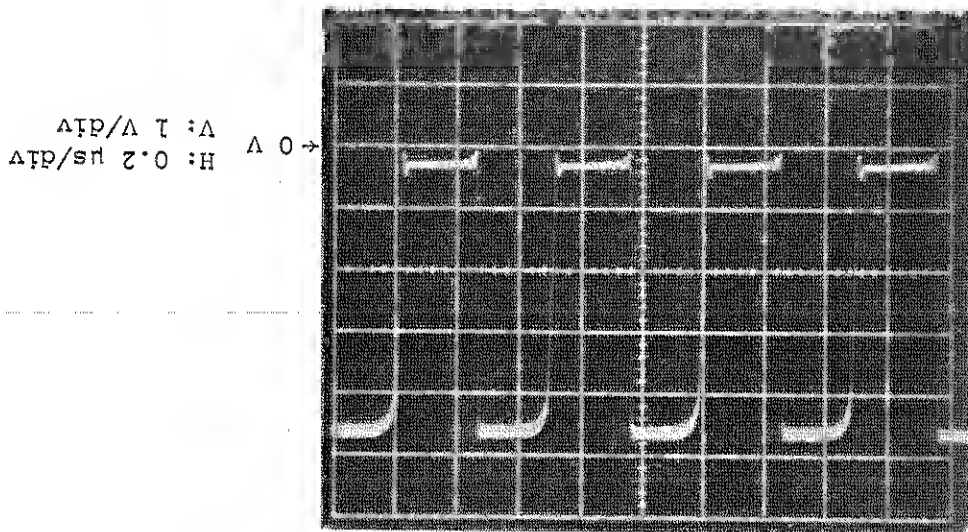
QTY	ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY				TRACED BY	SCALE	
APPROVED BY				DRAWN BY	: :	
3						

Parts List	AAW 83353
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Z4 POWER SUPPLY Circuit Diagram

If the signal waveform is normal, go to the next step. If the signal waveform is abnormal, troubleshoot the circuit related to Z3 ①.

Fig. 3-10 Waveform at Z3 Test Point ①



- 3-10.
- (c) Use an oscilloscope to check that the signal waveform at Z3 test point ① is as shown in Fig. 3-10.
- (b) Turn the power on with the MH676A LOCAL CONTROL key held down. The MH676A control circuit is then initialized.
- (a) Remove the PC board Z3 and insert the extender board into where PC board Z3 was mounted. Then connect Z3 to the extender board. At this time, J2 of Z3 is open.
- (1) Troubleshooting

- The above table lists the standard voltages. The tolerance range is $\pm 10\%$. If all voltages are normal, no troubleshooting is required.
1. If the voltage at ⑩ is abnormal, troubleshooting the circuit for Q45.
 2. If the voltages at ⑥ and ⑦ are abnormal, troubleshooting the circuits for Q10, Q11, Q6, and Q12.
 3. If the voltages at ⑧ and ⑨ are abnormal, troubleshoot the circuits for Q15, Q16, Q17, and Q12.

Setting	CLOCK and DATA OFFSET		CLOCK and DATA MULTITUDE	
	⑥ to ⑩	⑨	⑩	⑩
	-1 V	0.4 V	+4 V	2 V
			2.5 V	
			1 V	
			0.4 V	
			3 V	
			1.25 V	

Table 3-6 Standard Values at Z3 Test Points ⑥ to ⑩

- (e) Measures the voltages at Z3 test points ⑥ to ⑩ with the panel set as follows:
- (d) Use an oscilloscope to check that the levels at Z3 test points ②, ③, and ④ are high ($+3$ to $+5.5$ V). If the levels are within this range, go to the next step. If the levels are abnormal, troubleshoot the circuit for Z3 test points ②, ③, and ④.

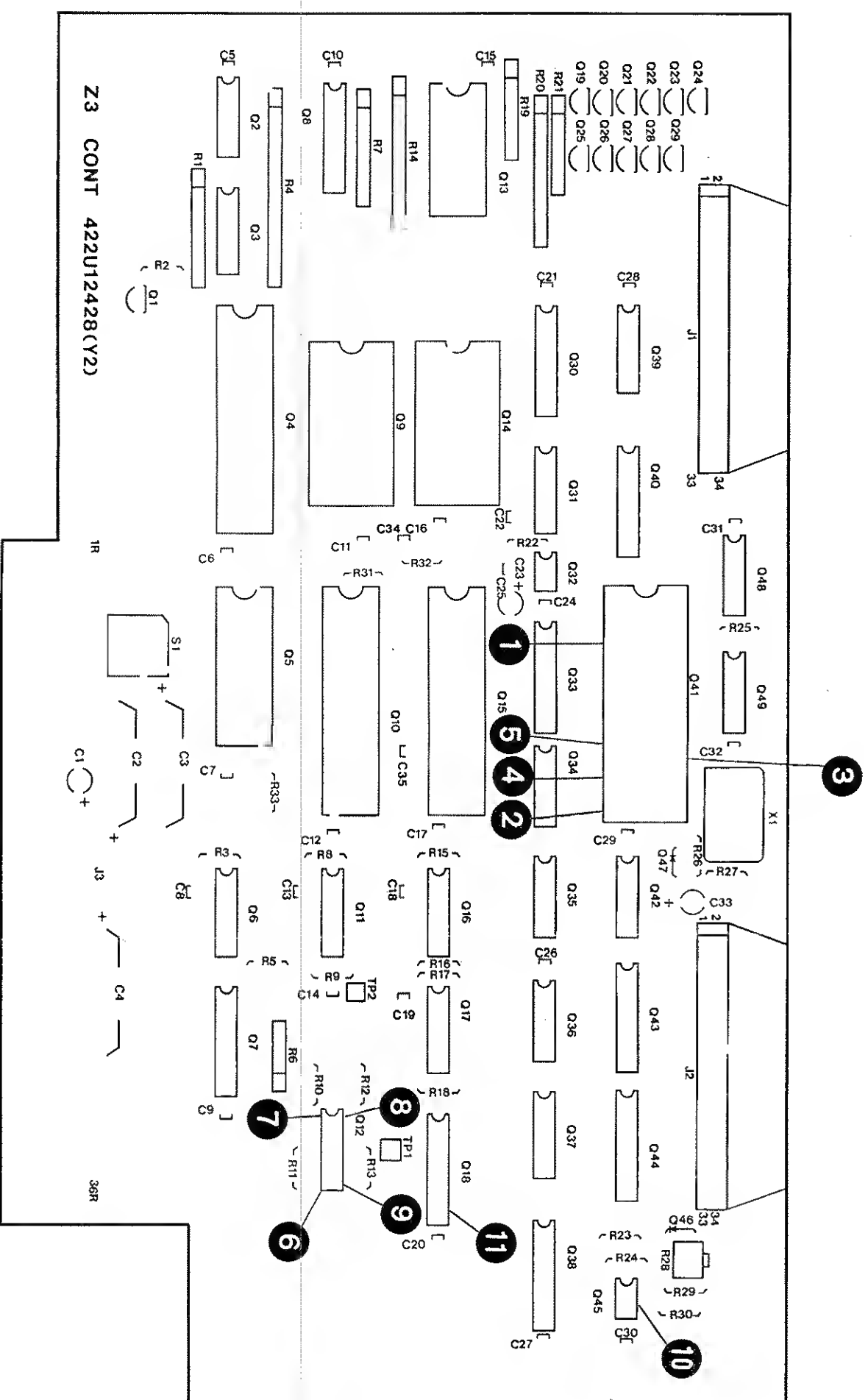
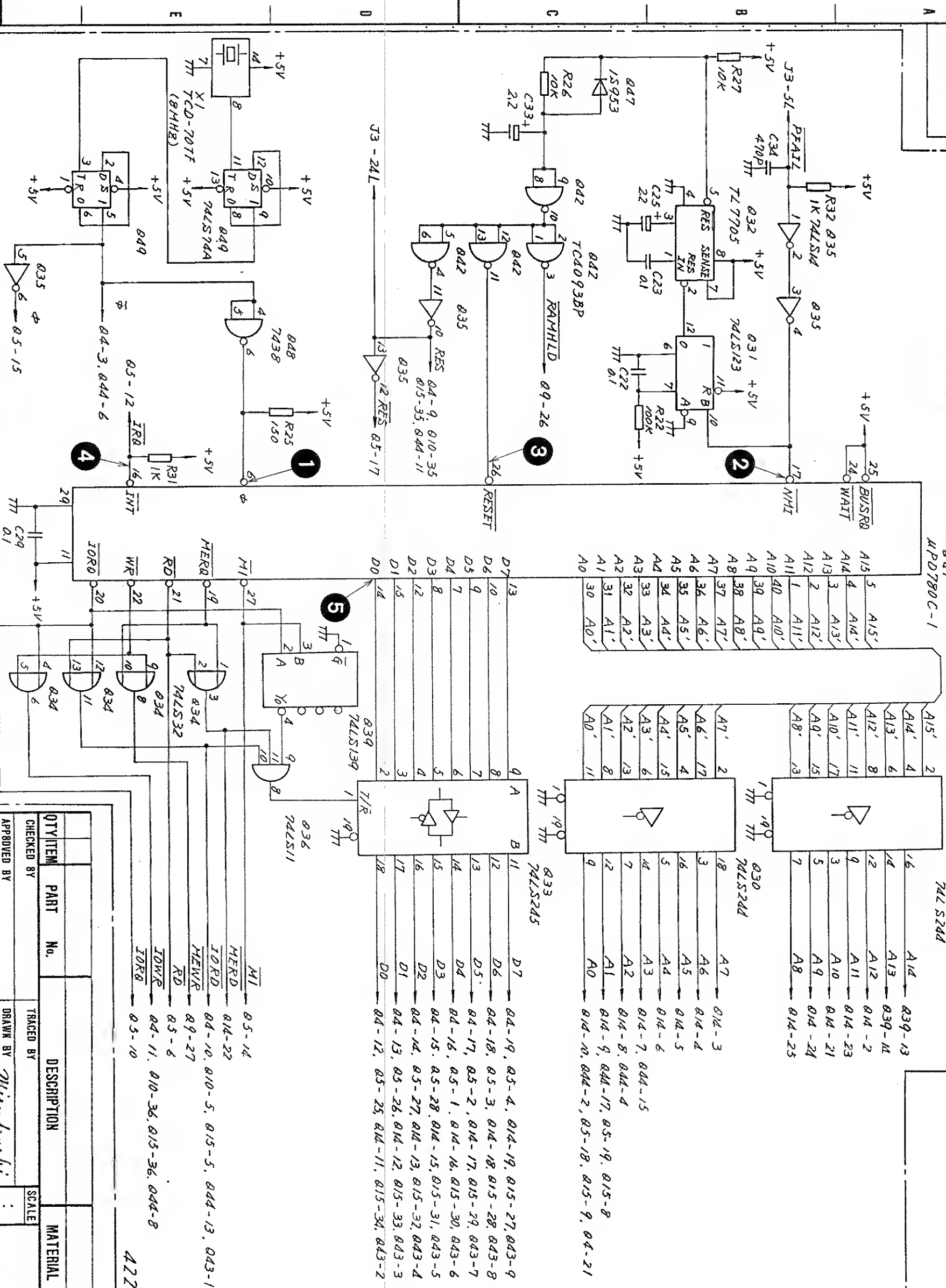


Fig. 3-11
 Parts Layout of MH676A Z3
 Control PC Board **4**
 3-29/(3-30 blank)

[illegible]

Z3 CONTROL Circuit Diagram

DRAWING No. 43W 33612 $\frac{1}{6}$

No. 0023-1985.08

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2

63

4

573

1

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3-3L/3-3L

43 W 33612	1/6
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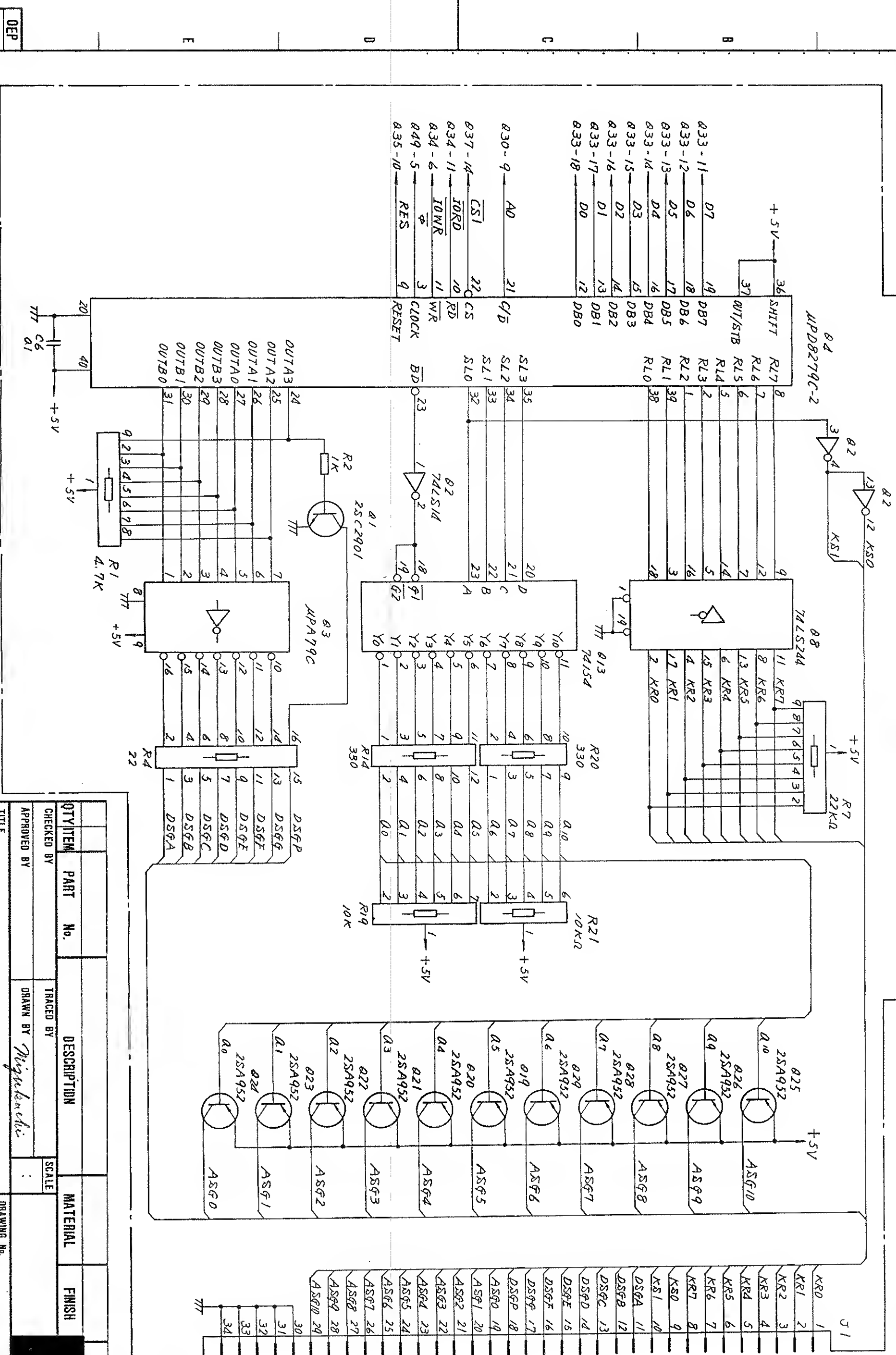
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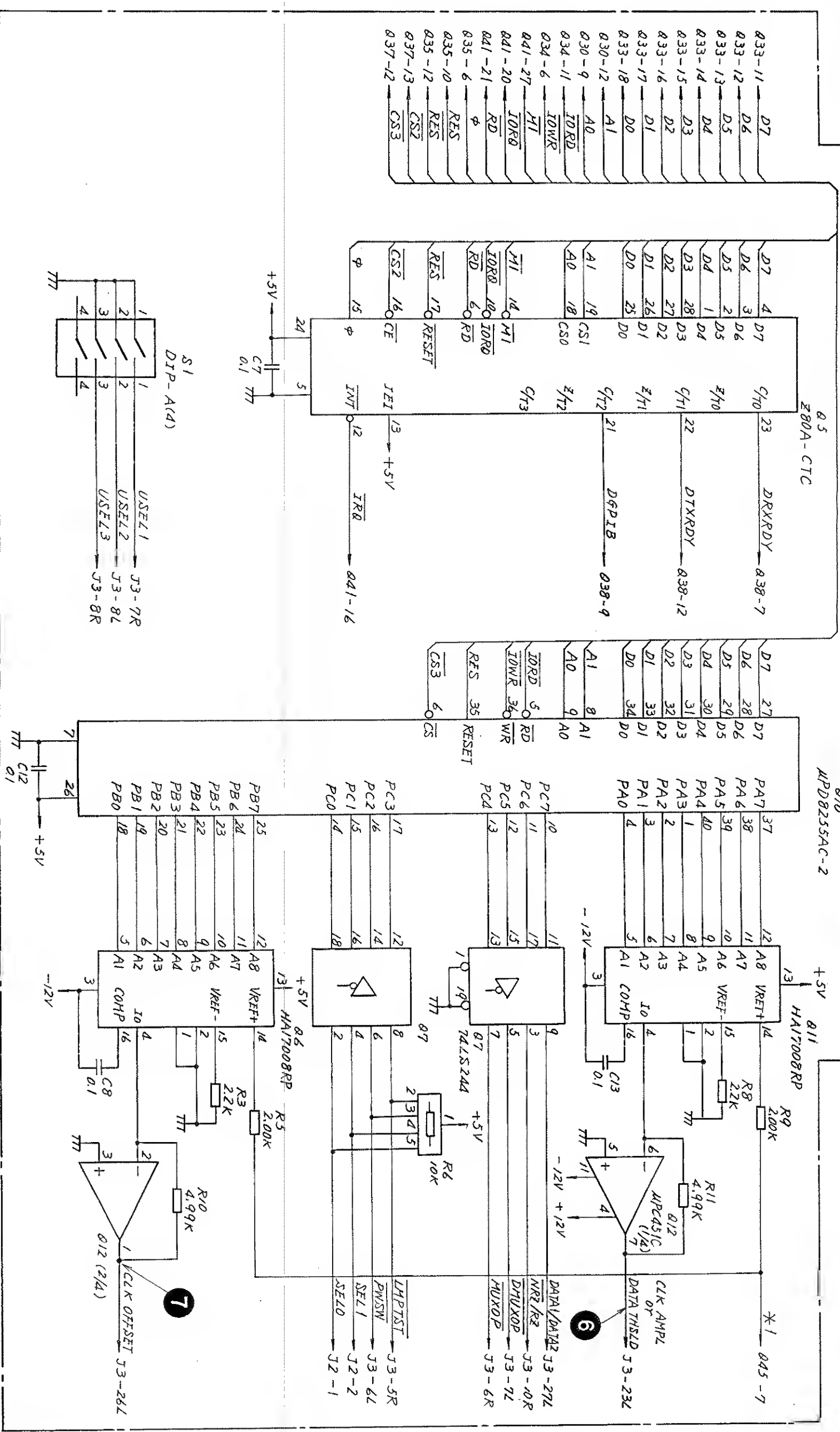
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218528



(DISPLAY circuit)

QTY/ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY			TRACED BY	SCALE	
APPROVED BY			DRAWN BY	:	
TITLE					DRAWING No.



Note: Switch S1 Setting

DEP

Unit	1	2	3
HH 676A	ON	ON	ON
HH 677A	OFF	ON	ON

[illegible]

No. 0023-1985.08

43W 33612	4/6
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2

3

4

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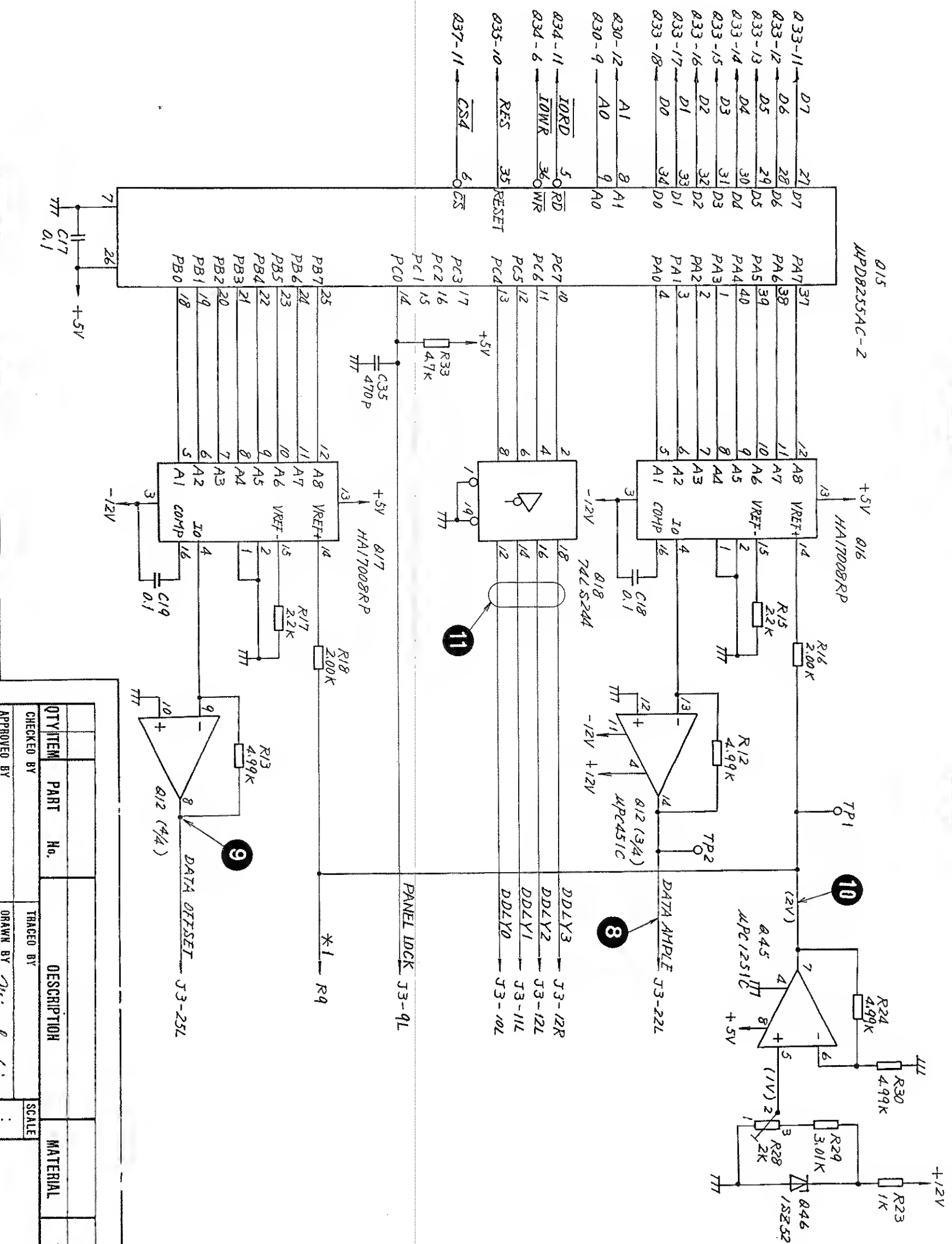
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11

3

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3-37/3-38

DEP

QTY	ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH		
CHECKED BY				TRACED BY			SCALE	
APPROVED BY				DRAWN BY			:	
				<i>W. J. Induct</i>				
TITLE						DRAWING No.		
								4

(1) Circuit description

Figure 3-12 shows the Z2 Multiplexer input circuit block diagram. This circuit receives DATA1, DATA2, and CLOCK signals from the ME522A Transmitter. These signals pass through the pulse shaper. The DATA1 and DATA2 signals are AND-gated with the CLOCK and clock (reverse polarity) signals and are converted into two RZ signals. After passing through the pulse shaper, the RZ signals are converted into DATA output signals by OR-gating. The output signal speed is twice the input data signal speed.

The CLOCK signal passes through the pulse shaper and is branched into the CLOCK and clock signals. The two signals are differentiated and OR-gated. The OR-gated signal passes through the variable high-pass and low-pass filters controlled by the frequency-to-voltage converter (explained later), and is converted into a frequency signal that is twice as fast as the input CLOCK signal.

The f-v converter divides the CLOCK signal by 1/1024 and the multiplier converts the pulse width into a fixed value. Then the signal is converted into a dc voltage through the integrator.

(2) Troubleshooting

(a) Disconnect all connectors connected to J2 to J6 of PC board Z2.

Remove PC board Z2, insert the extender board into the Z2 PC board position and connect Z2 to it.

Then, connect the DATA1, DATA2, and CLOCK 2 OUTPUT terminals of the ME522A Transmitter to J2, J3, and J5 respectively of the MH676A PC board Z2 using cables of the same length.

(BNC-P to SMA-J) conversion connector and SMA-P-RG58A/U SMA-P 1 m coaxial cable)

Connect the EXTERNAL TRIG INPUT terminal of a sampling oscilloscope to the CLOCK SYNC OUTPUT terminal of ME522A Transmitter, and observe the waveforms.

(b) Setting ME522A Transmitter and MH676A

1. ME522A Transmitter

Frequency: 350 MHz

PATTERN : PRBS 2²³

LOAD : 50 Ω

LOGIC : Normal

2. MH676A

Turn the power on with the LOCAL key held down to initialize the MH676A.

(c) Use the sampling oscilloscope with probe (MP671A) to check the waveform and phase at Z2 test points ① and ②.

If they are as shown in Fig. 3-13, go to the next step. If they are abnormal, follow the instructions below.

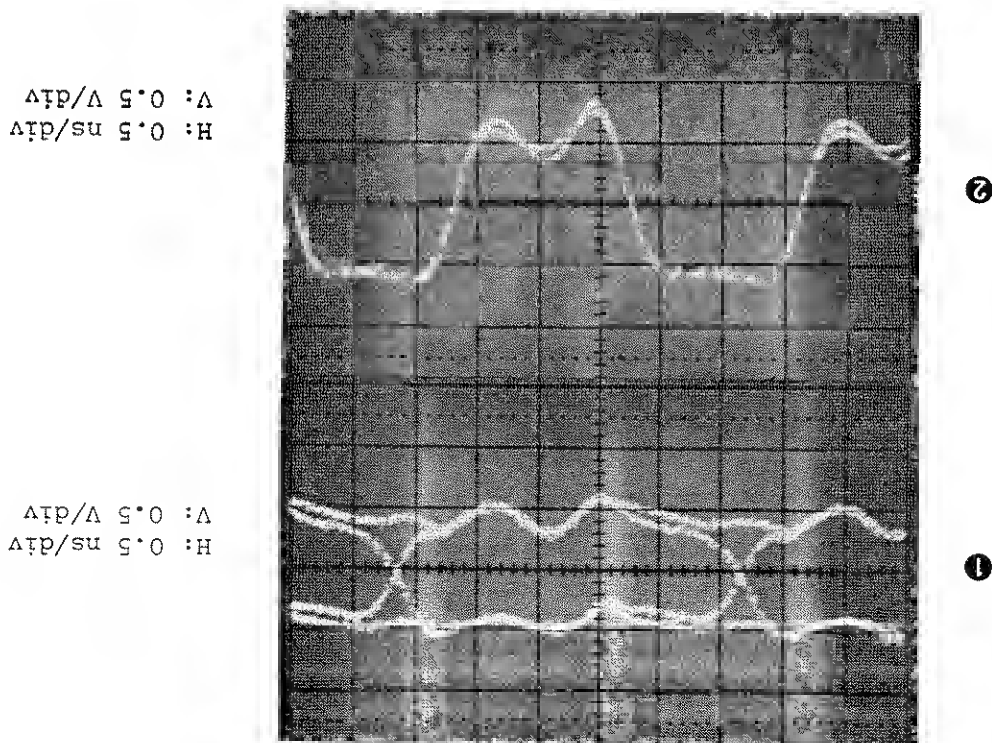
1. If the waveform at ① is abnormal, trouble-shoot the circuits for J2, Q2, Q4, and Q5, and the peripheral circuits.

2. If the waveform at ② is abnormal, trouble-shoot the circuits for J5, Q35, Q37, and Q49, and the peripheral circuits.

3. If the phase relationship between ① and ② is abnormal, check the input phase relationship between the DATA1 and CLOCK signals. If this relationship is also abnormal, troubleshoot the ME522A Transmitter for the DATA and CLOCK signal output phases.

- (d) Use the sampling oscilloscope with probe (MP671A) to check the waveform and phase at Z2 test points ③ and ④. If they are as shown in Fig. 3-14, go to the next step. If they are abnormal, follow the instructions below.
1. If the waveform at ③ is abnormal, trouble-shoot the circuits for J3, Q21, Q23, and Q24, and the peripheral circuits.
 2. If the waveform at ④ is abnormal, trouble-shoot the circuits for J5, Q35, Q37, and Q28, and the peripheral circuits.

Fig. 3-13 Waveforms at Z2 Test Points ① and ②



3. If the phase relationship between ③ and ④ is abnormal, check the input phase relationship between the DATA2 and CLOCK signals. If this relationship is also abnormal, troubleshoot the ME522A Transmitter for the DATA and CLOCK signal output phase.

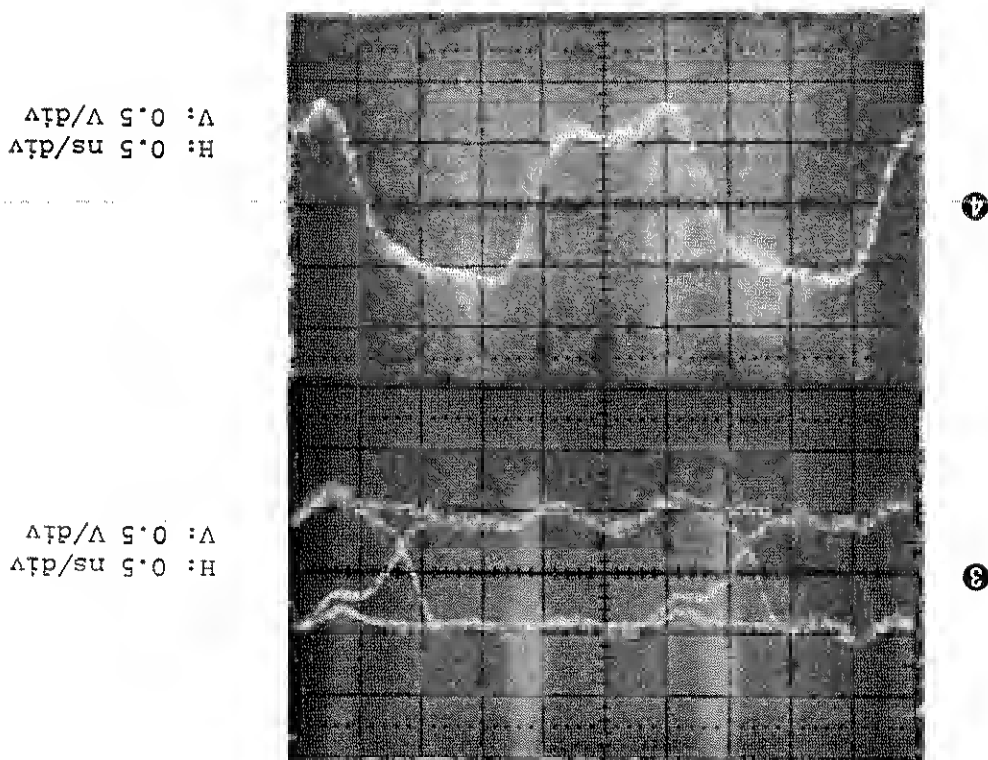
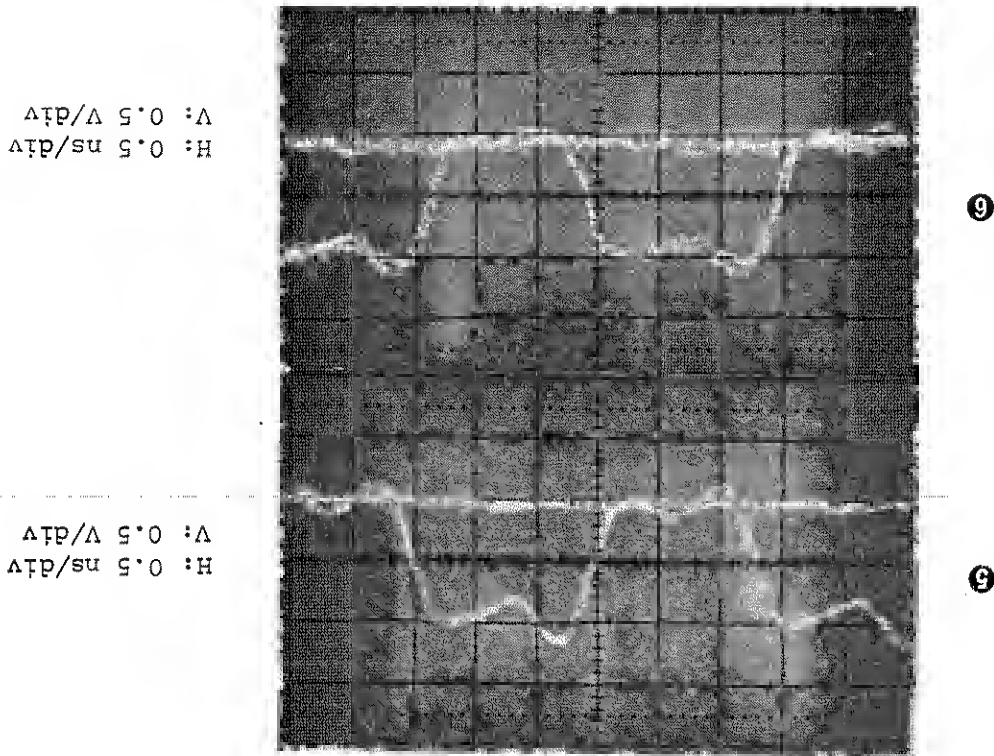


Fig. 3-14 Waveforms at Z2 Test Points ③ and ④

Fig. 3-15 Waveforms at Z2 Test Points ⑤ and ⑥



- (e) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test points ⑤ and ⑥ .
- If they are as shown in Fig. 3-15, go to the next step. If they are abnormal follow the instructions below.
1. If the waveform at ⑤ is abnormal, trouble-shoot the circuits for Q8 and Q13, and peripheral circuits.
 2. If the waveform at ⑥ is abnormal, trouble-shoot the circuits for Q27 and Q32, and peripheral circuits.

(f) Use a coaxial cable to connect the sampling oscilloscope to J4 and check the waveform at Z2 test point ⑦. Figure 3-16 shows the standard waveform.

If the waveform at ⑦ is abnormal, trouble-shoot the circuits for Q15, Q16, Q18, and Q17, and the peripheral circuits.

R45 and R68 are variable resistors used to adjust the Q16 and Q17 gate bias. R47 and R65 are used to correct changes in the pattern signal mark rate, do not touch them.

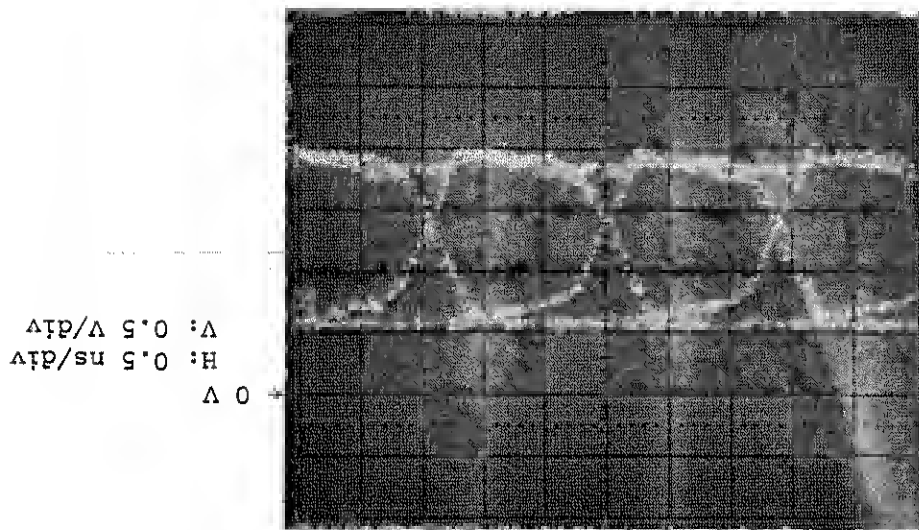
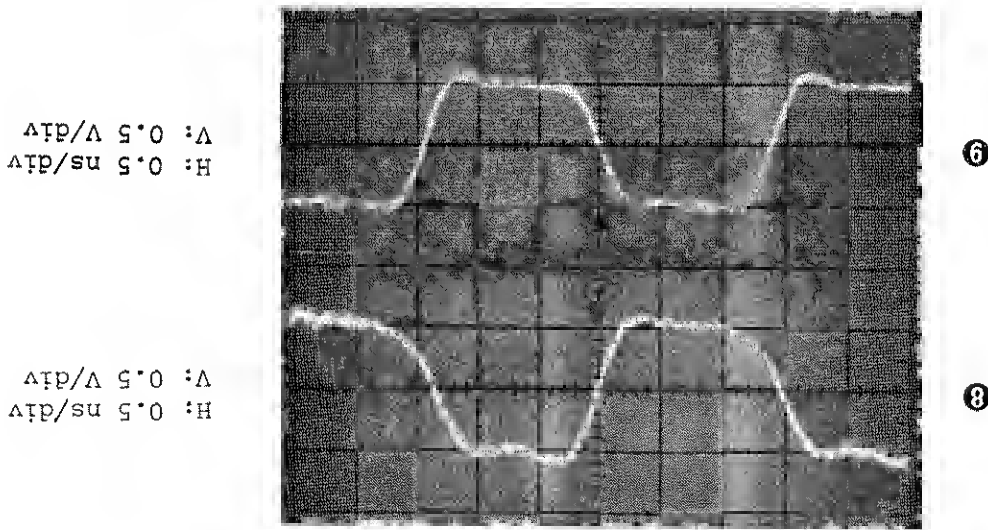


Fig. 3-16 Waveform at Z2 Test Point ⑦

(h) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑩. If the waveform is as shown in Fig. 3-18, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q48 to Q53, and the peripheral circuits.

Fig. 3-17 Waveform at Z2 Test Points ⑧ and ⑨

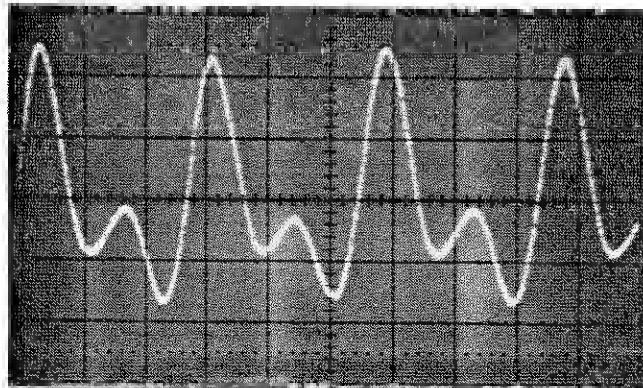


(g) Use the sampling oscilloscope with probe (MP671A) to check the waveforms at Z2 test points ⑧ and ⑨. If they are as shown in Fig. 3-17, go to the next step. If they are abnormal, troubleshoot the circuits for Q35, Q37, and Q39, and the peripheral circuits.

- (j) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑩ . If the waveform is as shown in Fig. 3-19, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q40 and Q43, and the peripheral circuits.
- (i) Use a dc voltmeter to measure the voltage at Z2 test point ⑩ and check that it is from 4.9 to 5.1 V when clock signals are generated, and from 0 to 0.1 V when no clock signals are generated. If the voltage is normal, go to the next step. If the voltage is abnormal, troubleshoot the circuits for Q40, Q43, and Q46, and the peripheral circuits.

Fig. 3-18 Waveform at Z2 Test Point ⑩

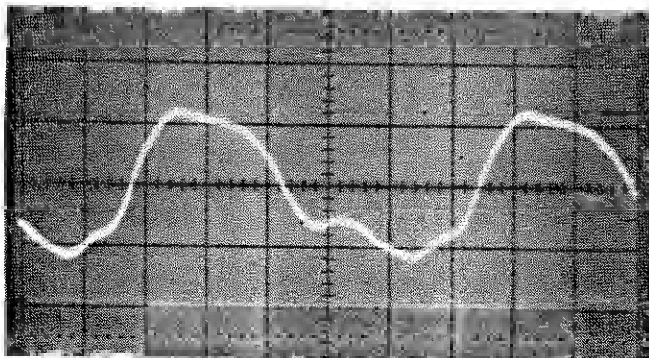
H: 0.5 ns/div
V: 0.5 V/div



(k) Use an oscilloscope with probe to check the waveforms at Z2 test points ⑬ and ⑭. If they are as shown in Fig. 3-20, go to the next step. If they are abnormal, troubleshoot the circuits for Q57 to Q59, Q61, Q62, Q65, and Q66, and the peripheral circuits. ⑮ indicates the frequency generated by dividing the input CLOCK signal frequency by 1/1024.

Fig. 3-19 Waveform at Z2 Test Point ⑮

H: 0.5 ns/div
V: 0.5 V/div

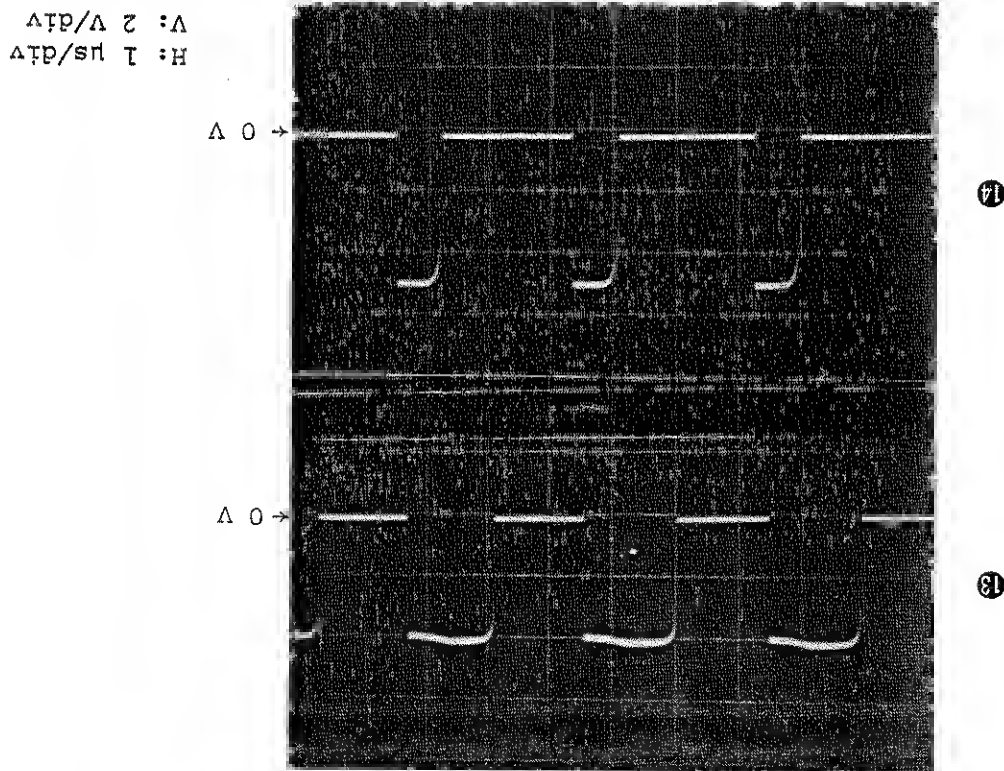


Input CLOCK signal frequency	700 MHz		
	+2.2 to +2.5 V	+12 to +14 V	+16 V to +19 V
Input CLOCK signal frequency	350 MHz		
	-0.3 to -0.6 V	+1.1 to +1.5 V	+1.2 to +1.6 V
	15	16	17

Table 3-7 DC Voltages at Z2 Test Points 15, 16, and 17

(1) Use a dc voltmeter to measure the dc voltages at Z2 test points 15 to 17 and check that they are as listed in the table below when the input CLOCK signal frequency is set to 350 MHz and 700 MHz.

Fig. 3-20 Waveform at Z2 Test Points 13 and 14



If voltages are normal, go to the next step.

If they are abnormal, troubleshoot the circuits for Q64 and Q63, and the peripheral circuits.

(m) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑮. If the waveform is as shown in Fig. 3-21, go to the next step.

Also check the waveform when the CLOCK frequency of the ME522A Transmitter is changed from 350 to 700 MHz.

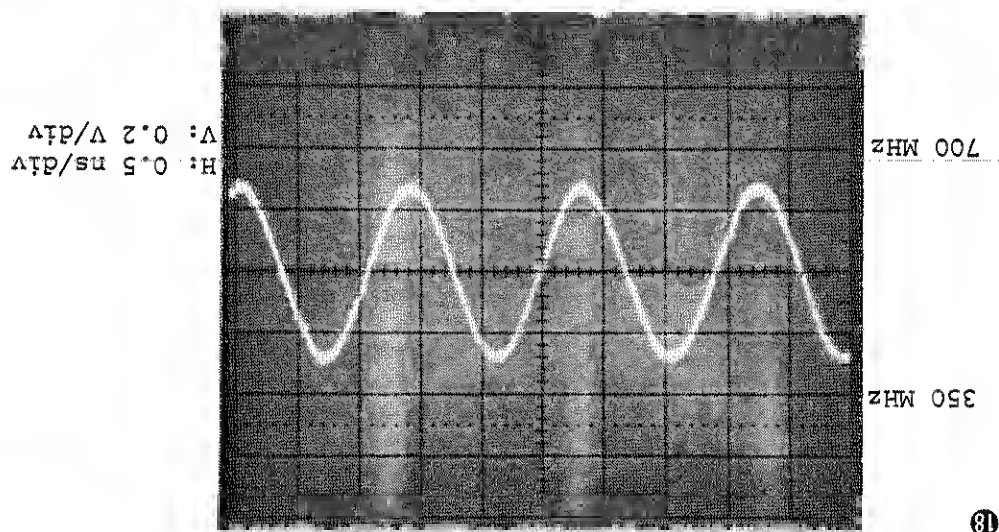
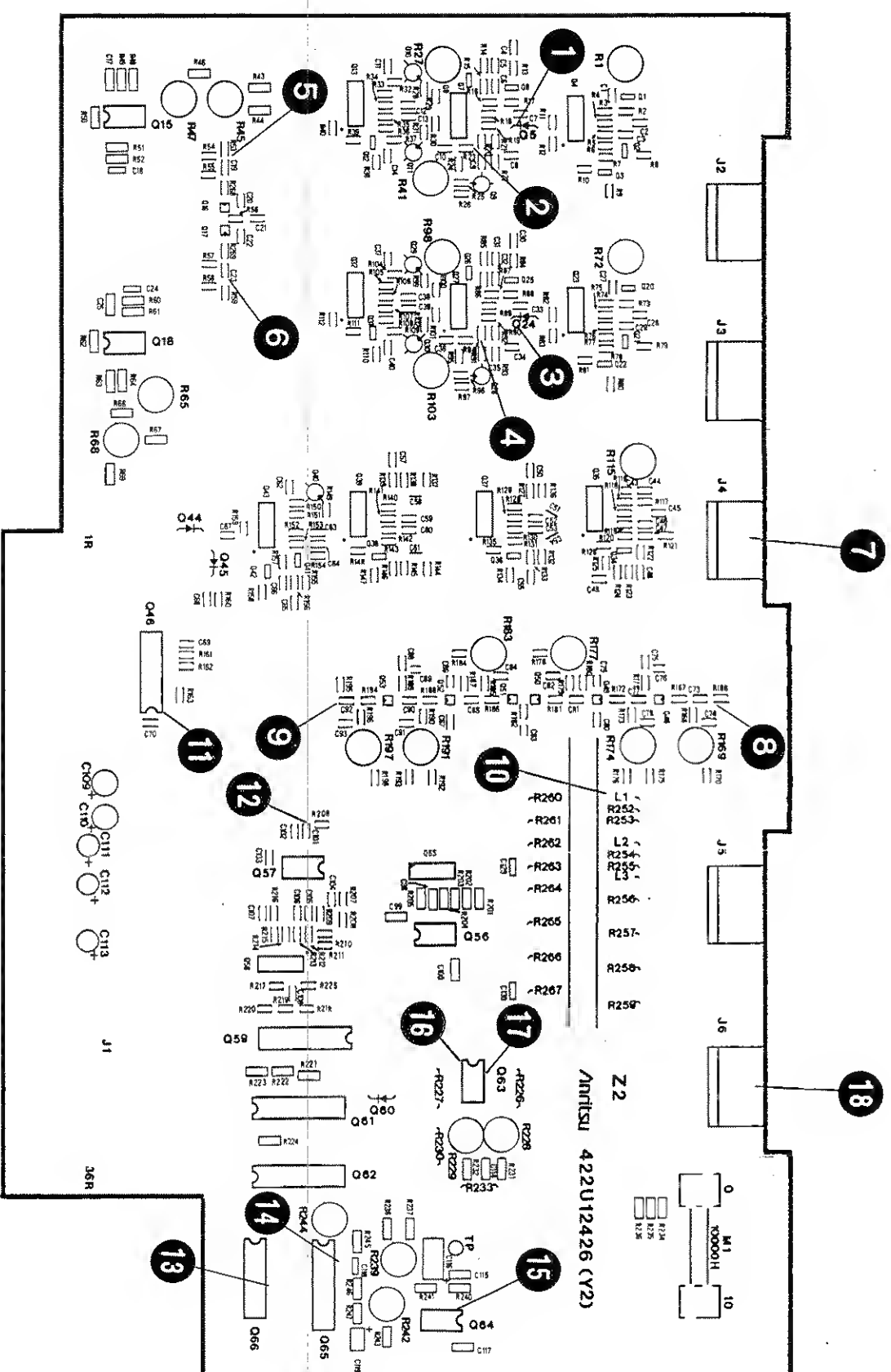
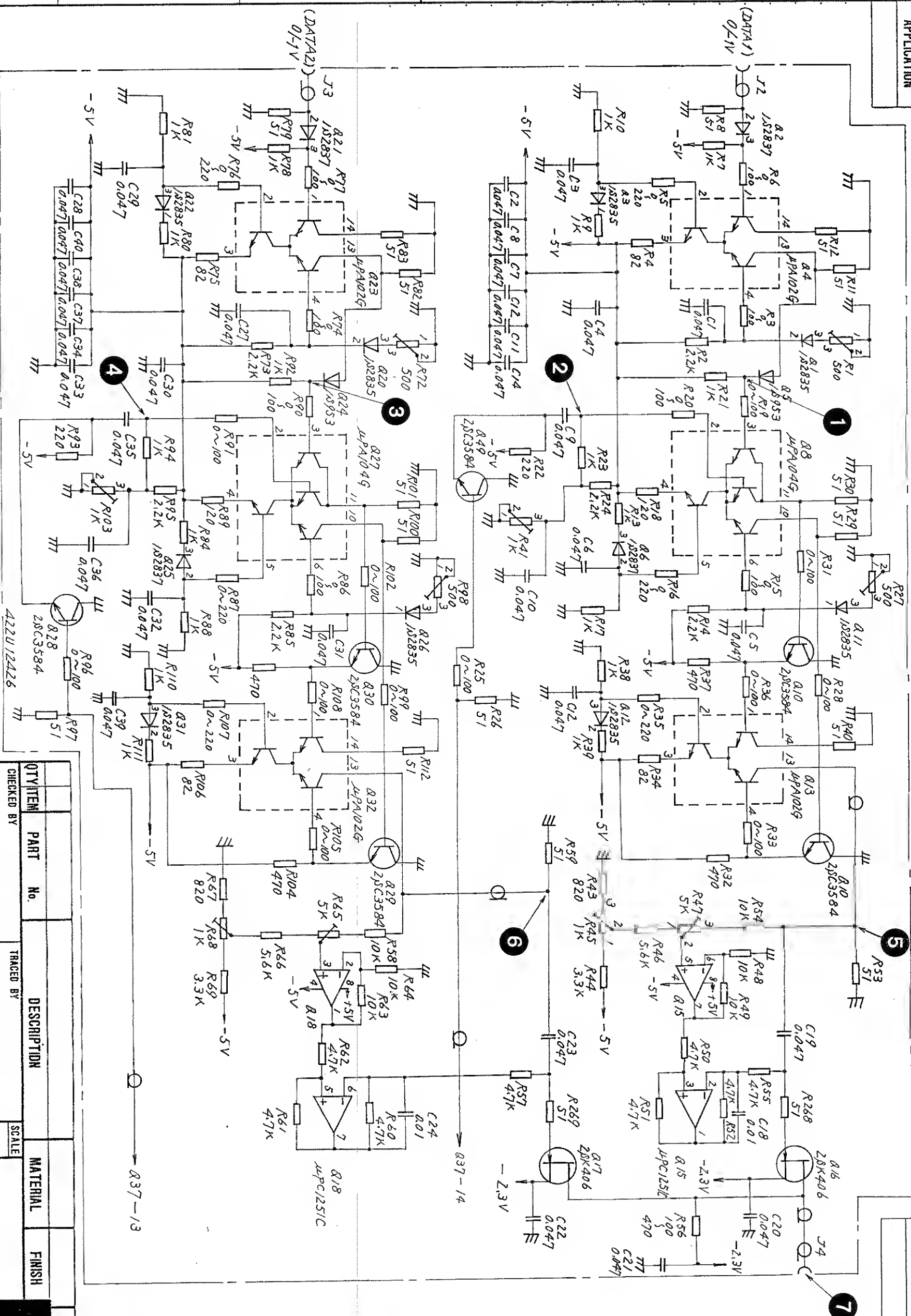


Fig. 3-21 Waveform at Z2 Test Point ⑮

If the waveforms are abnormal, troubleshoot the circuits from Q68 to Q83, and the peripheral circuits.



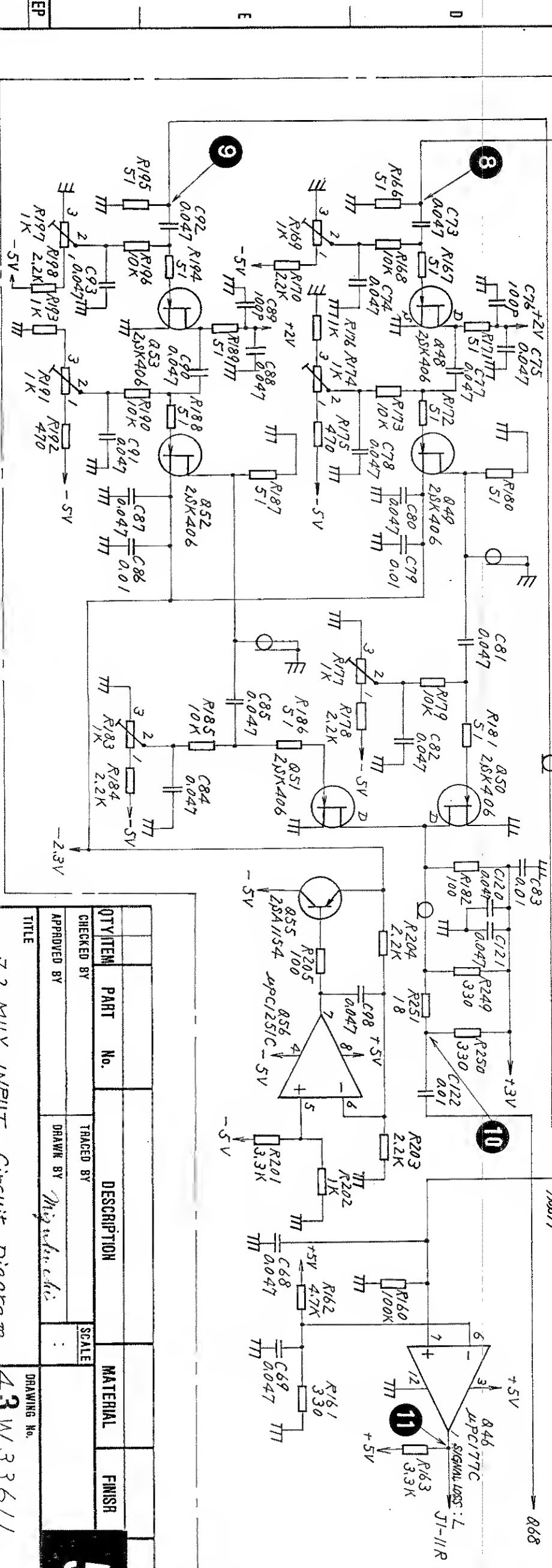
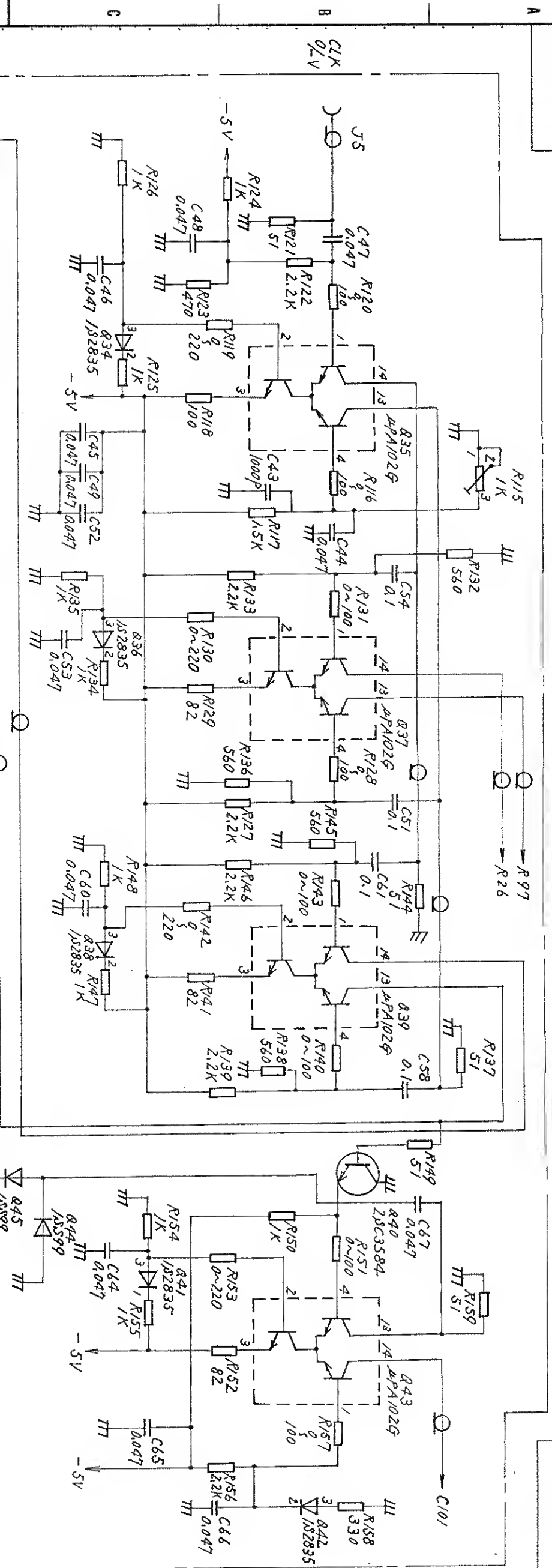
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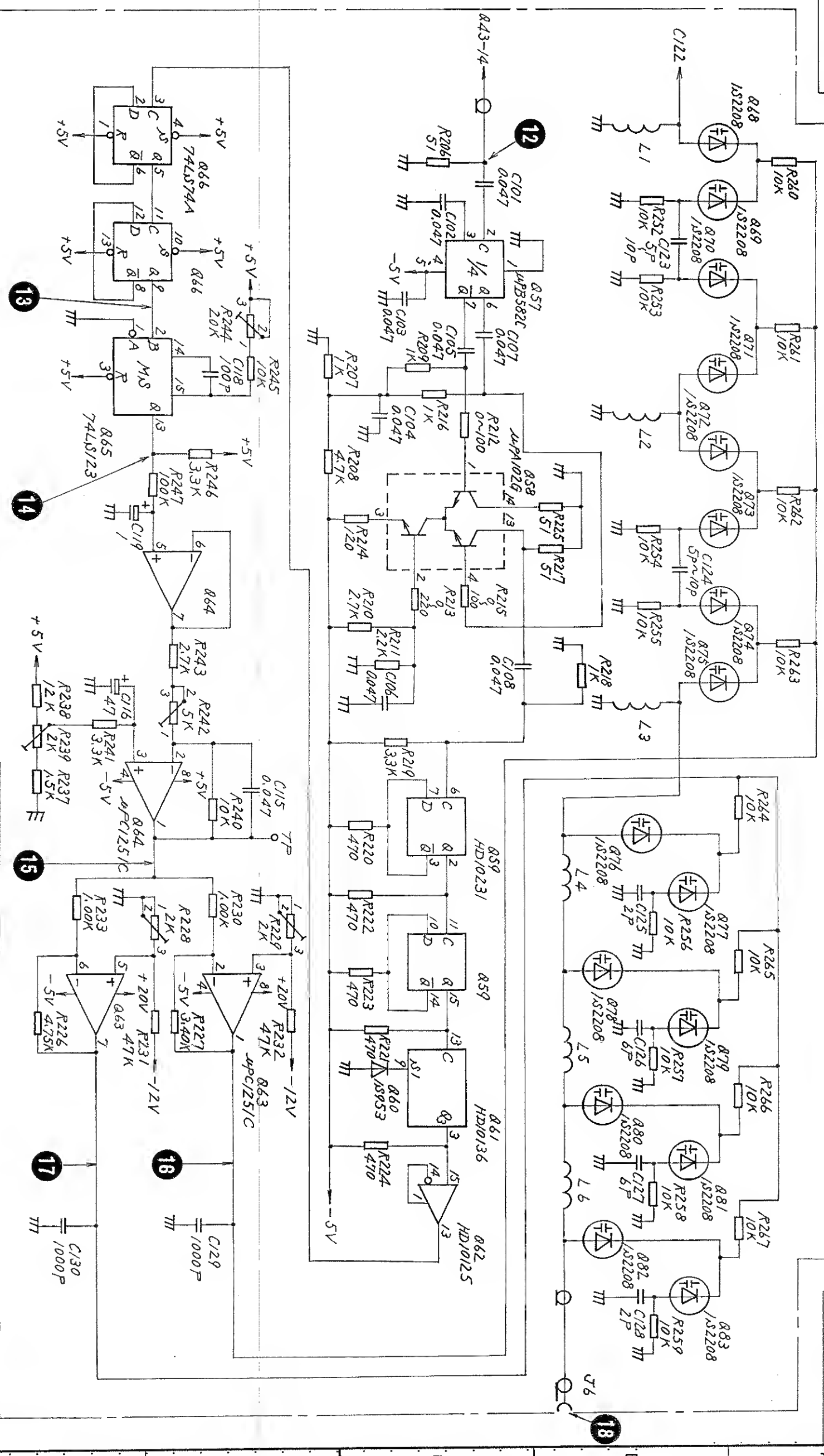
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TITLE				DRAWING No.

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QTY ITEM		PART No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY		TRACED BY		SCALE	
APPROVED BY		DRAWN BY <i>Miguel</i>			
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(1) Circuit description

Figure 3-23 shows the Z1 Multiplexer output

circuit block diagram.

This circuit receives DATA and CLOCK signals from the Z2 Multiplexer input PC board.

DATA signals are retimed by a D-type flip-flop and are DATA output through an AND-gate for format conversion (NRZ and RZ) and an output amplifier.

The output amplifier shapes and amplifies the DATA signals. The AMPLITUDE voltage is controlled by a control signal sent from the CONTROL PC board.

A control signal is sent from the CONTROL PC board through the offset circuit to control the offset voltage. The CLOCK signal is branched into three

signals: one is sent to the D-type flip-flop, one to the AND-gate to convert the format, and one to the output amplifier. Control signals sent from the

CONTROL PC board are also used to control the AMPLITUDE and OFFSET voltages in the output amplifier and OFFSET circuits (as for the DATA output circuit).

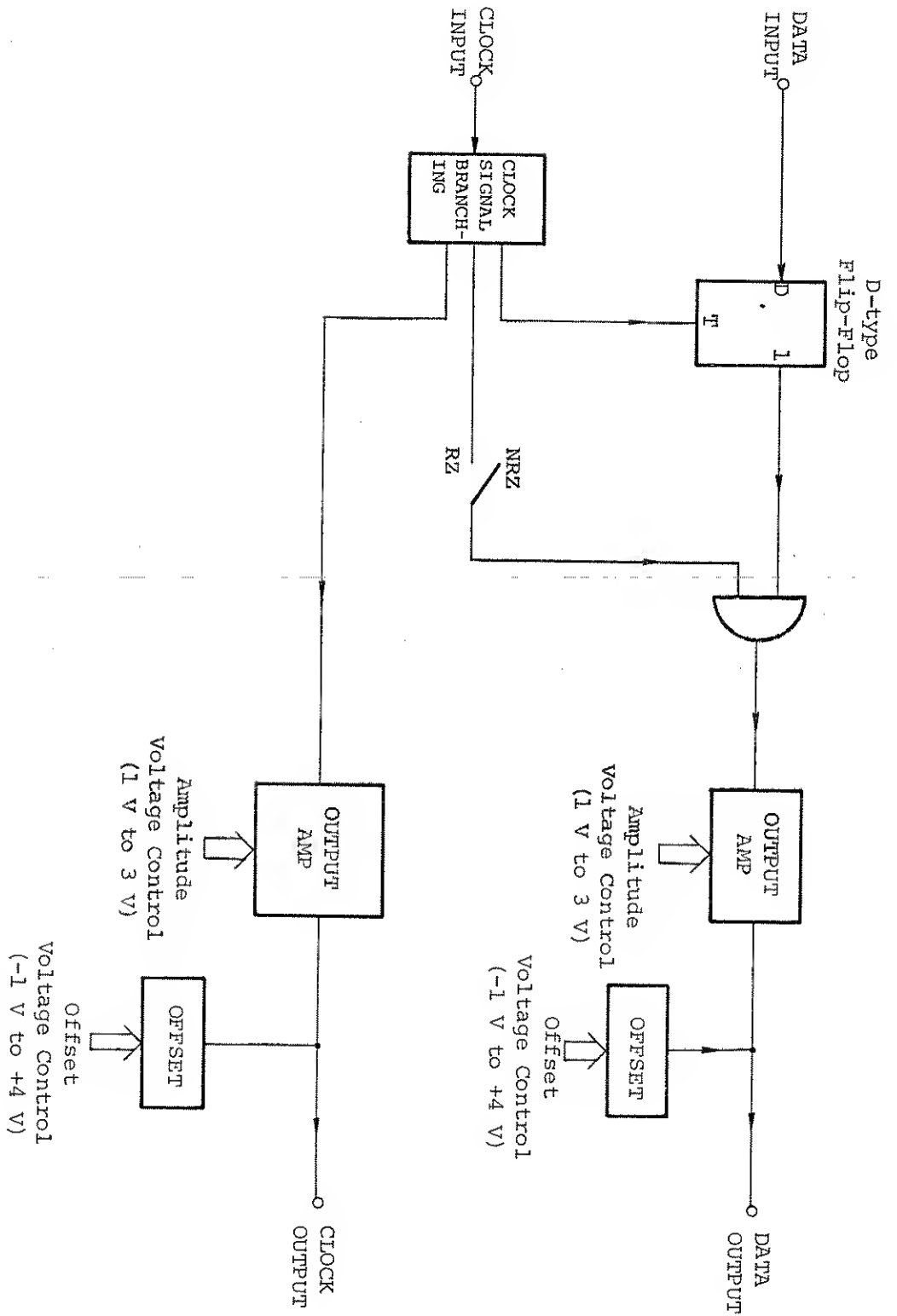


Fig. 3-23 Block Diagram of MH676A Z1 MUX OUTPUT

(2) Troubleshooting

(a) Disconnect all connectors that are connected to J2 to J4 of PC board Z1.

Remove the PC board Z1, insert the extender board in to the Z1 position and connect the PC board Z1 to it.

Connect J2 and J3 of PC board Z1 to J4 and J6 of PC board Z2 using cables of the same length. (SMA-P-RG58A/U·SMA-P 50 cm coaxial cable)

(b) Setting ME522A Transmitter and MH676A

1. ME522A Transmitter

Frequency: 350 MHz

PATTERN : PRBS 2²³-1

LOAD : 50 Ω

LOGIC : Normal

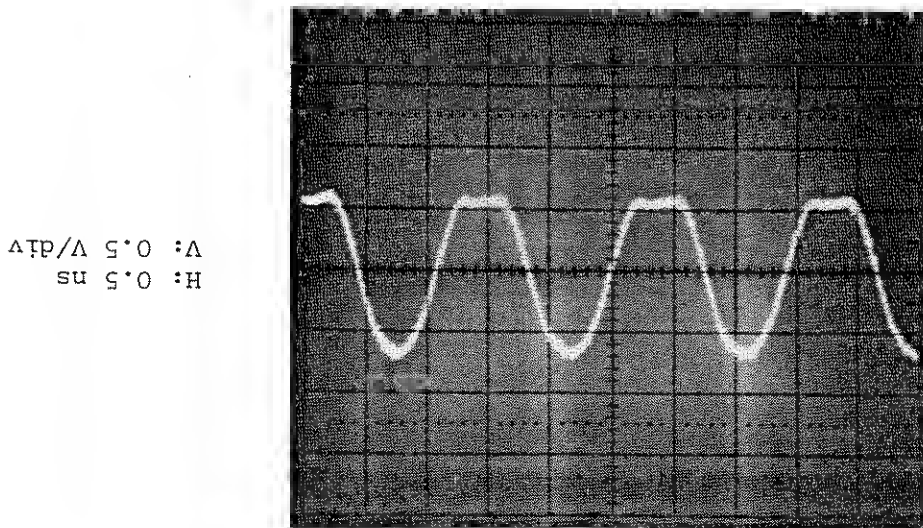
2. MH676A

Turn the power on with the LOCAL key held down to initialize the MH676A.

(c) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ①. If the waveform is as shown in Fig. 3-24, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q12, Q13, and Q46, and the peripheral circuits.

(d) Use the sampling oscilloscope with probe (MP671A) to check the waveform and phase at Z1 test points ② and ③. If they are as shown in Fig. 3-25, go to the next step. If test point ③ does not meet the specified standards, troubleshoot the circuits for Q15 and Q5, and the peripheral circuits. If test point ② does not meet the specified standards, perform the same troubleshooting as for Z2 test point ⑦. (See Fig. 3.5.4.)

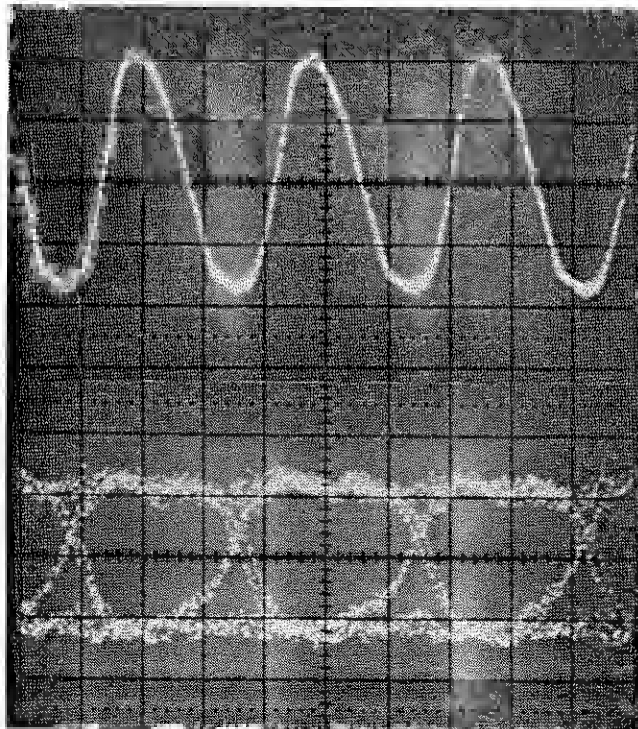
Fig. 3-24 Waveform at Z1 Test Point ①



(e) Use the sampling oscilloscope with probe (MP671A) to check the waveforms at Z1 test points ④ and ⑤. If the waveforms are as shown in Fig. 3-26, go to the next step. If the waveforms are abnormal, troubleshoot the circuit for Q6, and the peripheral circuits.

Fig. 3-25 Waveforms at Z1 Test Points ② and ③

H: 0.5 ns/div
V: 0.5 V/div



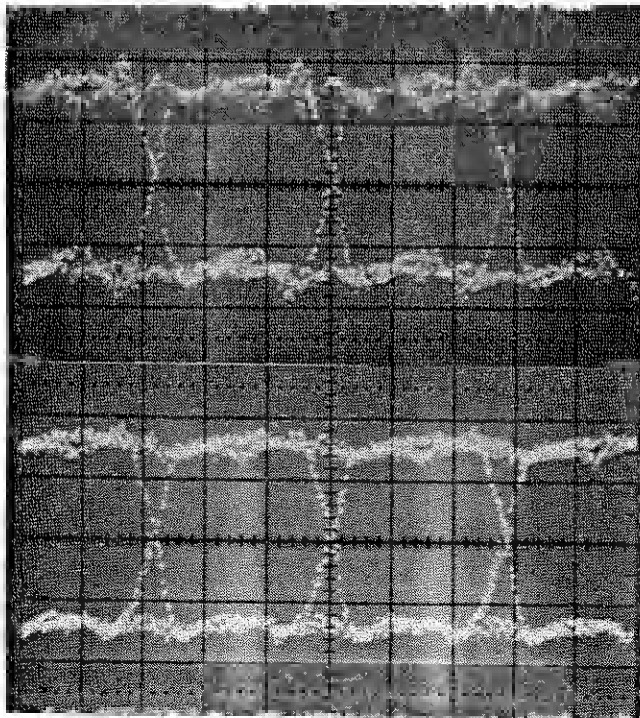
③

②

(f) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑥. If the waveform is as shown in Fig. 3-27, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q27 and Q18, and the peripheral circuits.

Fig. 3-26 Waveforms at Z1 Test Points ④ and ⑤

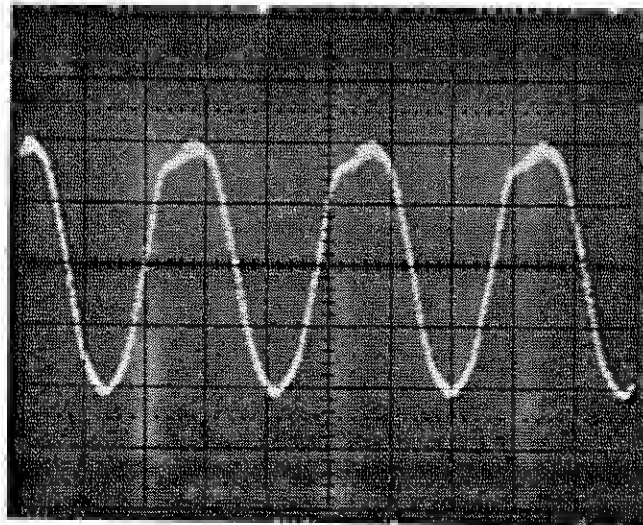
H: 0.5 ns/div
V: 0.5 V/div



(g) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑦. Figure 3-28 shows the normal waveform. The waveform must be checked in both NRZ and RZ formats. If the NRZ waveform is abnormal, troubleshoot the circuits for Q8, Q9, and Q25, and the peripheral circuits. If the RZ waveform is abnormal, troubleshoot the peripheral circuits of Q24 and K2.

Fig. 3-27 Waveform at Z1 Test Point ⑥

H: 0.5 ns/div
V: 0.5 V/div



(h) Use the sampling oscilloscope to check the waveform at Z1 test point ⑧. Figure 3-29 shows the normal waveform. The waveform must be checked in both NRZ and RZ formats. If the waveforms are abnormal, troubleshoot the circuits for Q21, Q22, Q28, and Q30, and the peripheral circuits.

Fig. 3-28 Waveform at Z1 Test Point ⑦

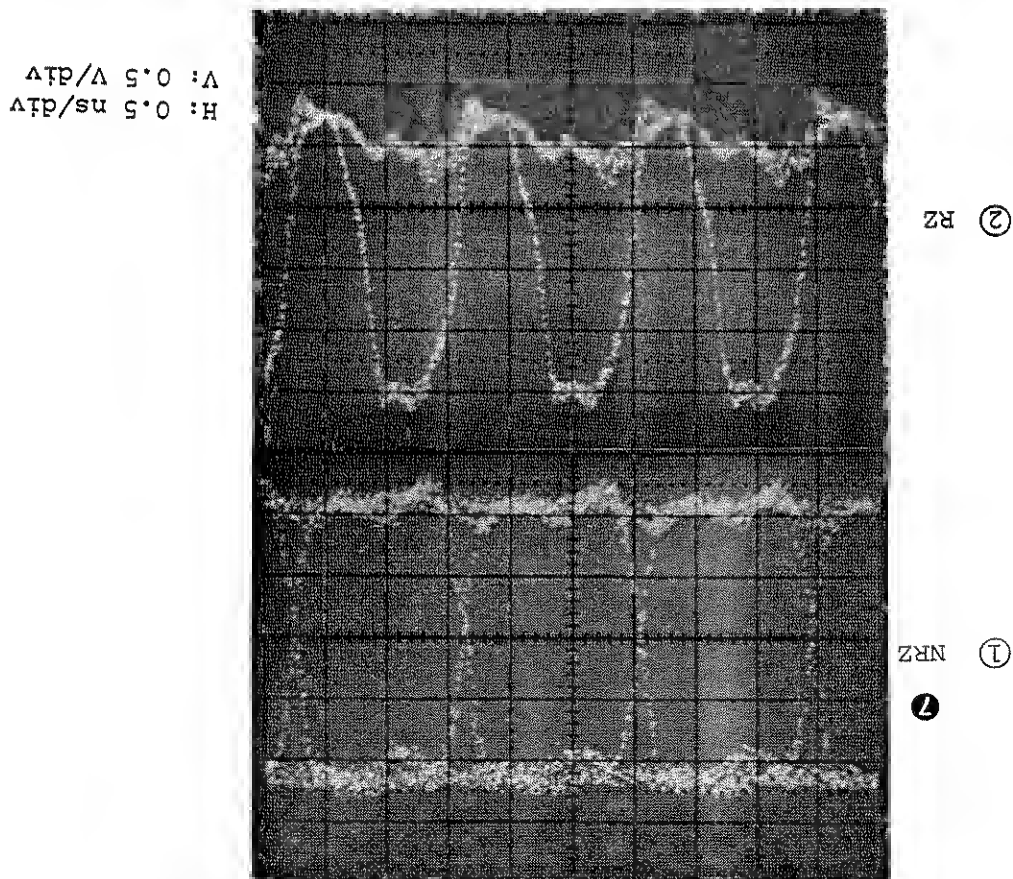
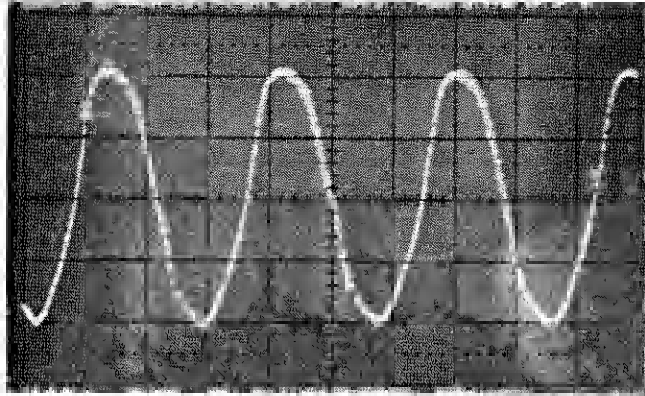


Fig. 3-30 Waveform at Z1 Test Point ⑨

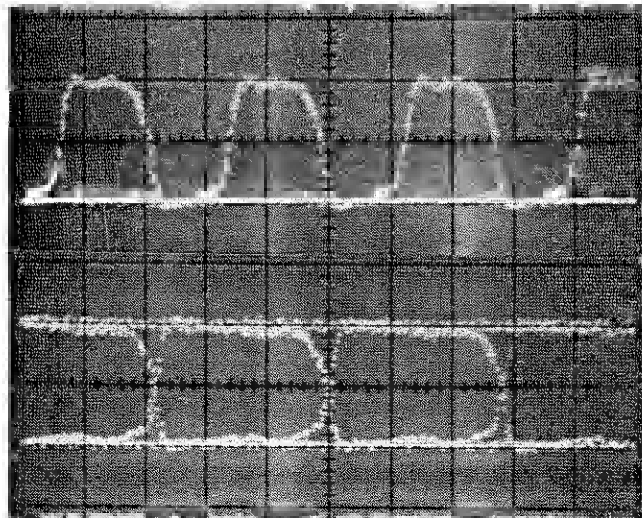
H: 0.5 ns/div
V: 0.5 V/div



(1) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑨. If the waveform is as shown in Fig. 3-30, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q15 and Q16, and the peripheral circuits.

Fig. 3-29 Waveforms at Z1 Test Point ⑧

H: 0.5 ns/div
V: 0.5 V/div

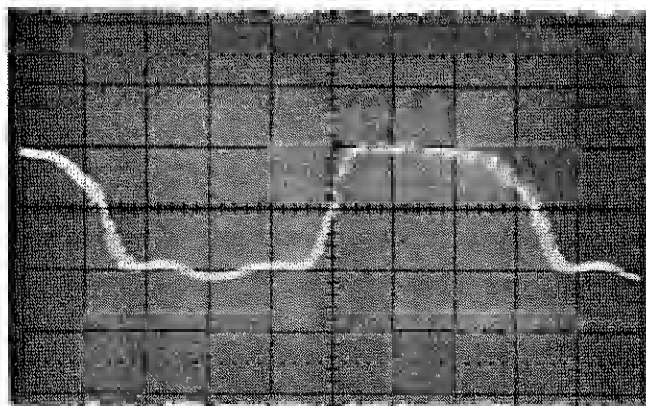


② RZ

① NRZ

(j) Use the sampling oscilloscope with probe to check the waveform at Z1 test point ⑩ .

If the waveform is as shown in Fig. 3-31, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q35, Q32, and Q33, and the peripheral circuits.



H: 0.2 ns/div
V: 0.5 V/div

Fig. 3-31 Waveform at Z1 Test Point ⑩

(k) Use a dc voltmeter to check the dc voltages at Z1 test points ⑩ , ⑪ , and ⑫ .

If the voltages are as listed in Table 3-8, go to the next step. If the voltage is abnormal, troubleshoot the circuit for Q47 and Q49, and the peripheral circuits.

Table 3-8 Dc Voltages at Z1 Test Points ⑩ , ⑪ , and ⑫

Dc Voltage	⑩	⑪	⑫
1.5 V			
2.0 V			
3.0 V			

The above table lists the standard values. The tolerance range is $\pm 10\%$.

(1) Use a dc voltmeter to check the dc voltages at Z1 test points 14 to 23.

If the voltages are as listed in Tables 3-9 to 3-12, go to the next step. If the voltages are abnormal, troubleshoot the circuits for Q36 to Q39, Q42, and Q43, and the peripheral circuits.

Table 3-9 Dc Voltages at Z1 Test Points 14, 15, and 16

DATA OUTPUT	AMPLITUDE		
		1 V	3 V
		+0.4 to +0.5 V	+1.1 to +1.3 V
		+1 to +1.2 V	+3.0 to +3.5 V
		-1.0 to -1.2 V	-3.3 to -3.6 V
		14	15

Table 3-10 Dc Voltages at Z1 Test Points 17 and 18

DATA OUTPUT	OFFSET		
		-1 V	+4 V
		+0.4 to +0.5 V	+2.4 to +2.6 V
		+1.0 to +1.2 V	-4.0 to -4.4 V
		17	18

Table 3-11 Dc Voltage at Z1 Test Points 21, 22, and 23

CLOCK OUTPUT	AMPLITUDE		
		1 V	3 V
		+0.4 to +0.5 V	+1.1 to +1.3 V
		+1 to +1.2 V	+3.1 to +3.5 V
		-1.1 to -1.3 V	-3.5 to -3.9 V
		21	22

Table 3-12 Dc Voltages at Z1 Test Points
 19 and 20

CLOCK OUTPUT	OFFSET	-1 V	+0.4 to +0.5 V	+1.1 to +1.3 V
		+4 V	+2.4 to +2.6 V	-4.0 to -4.4 V
			19	20

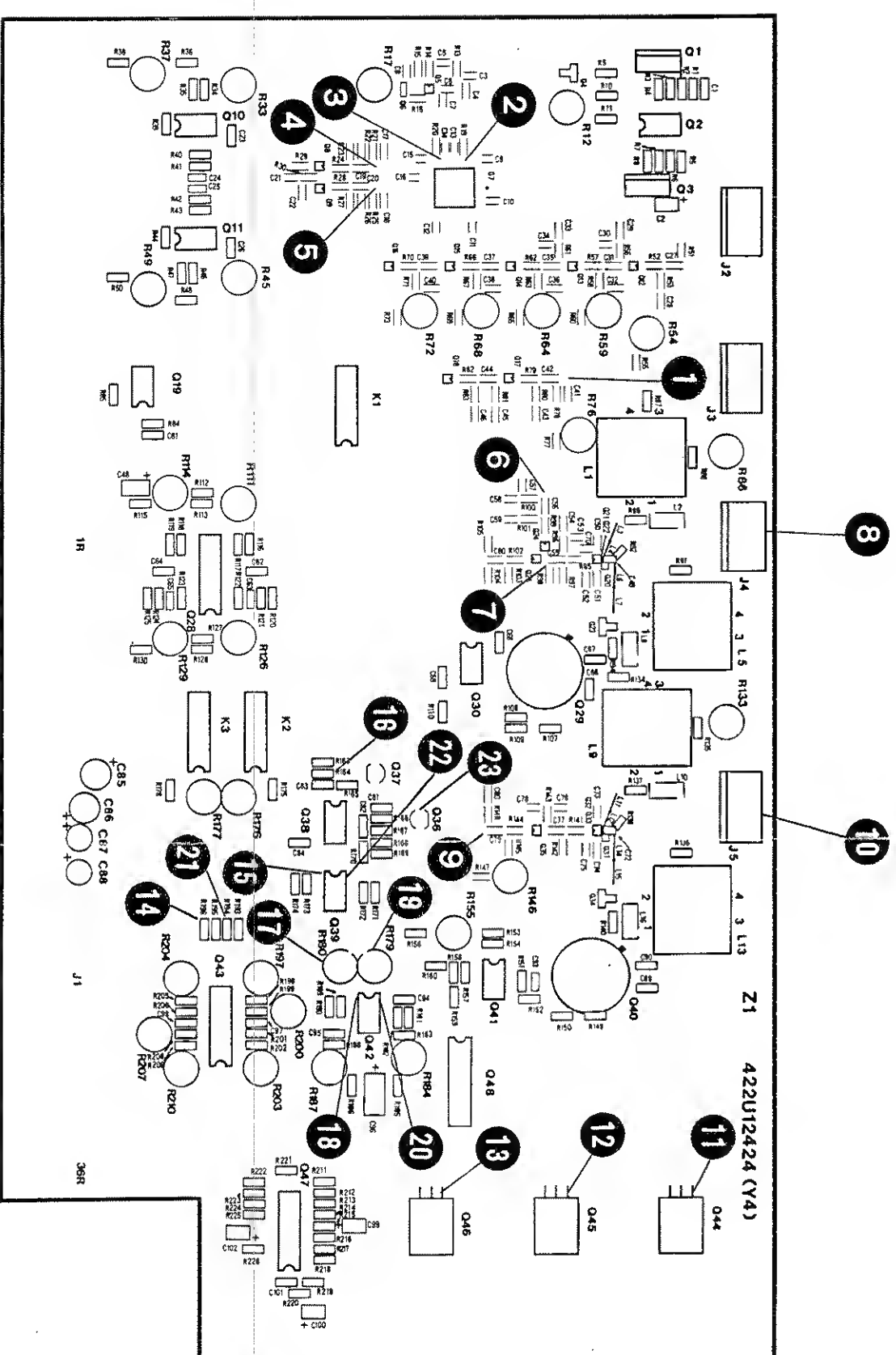
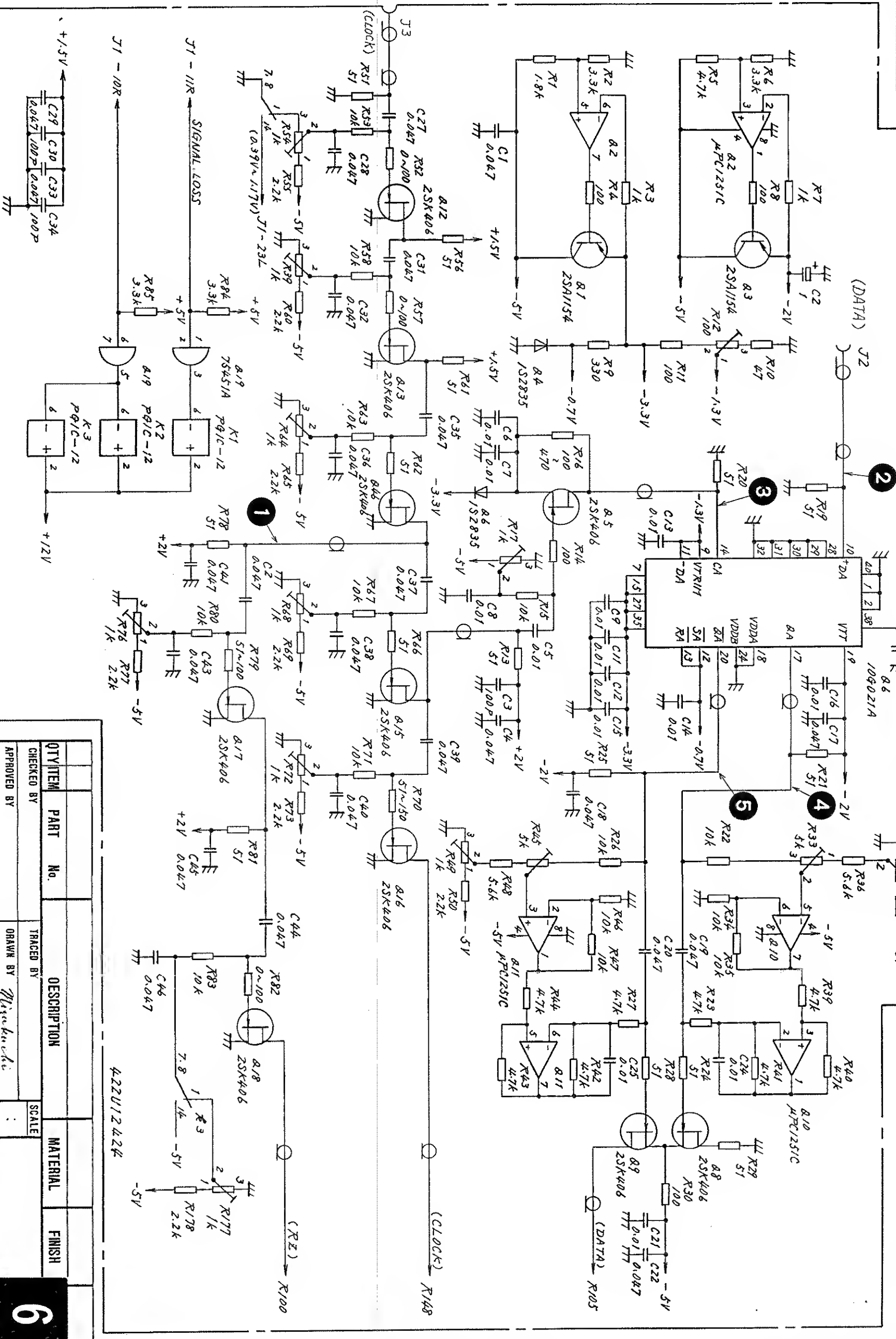


Fig. 3-32

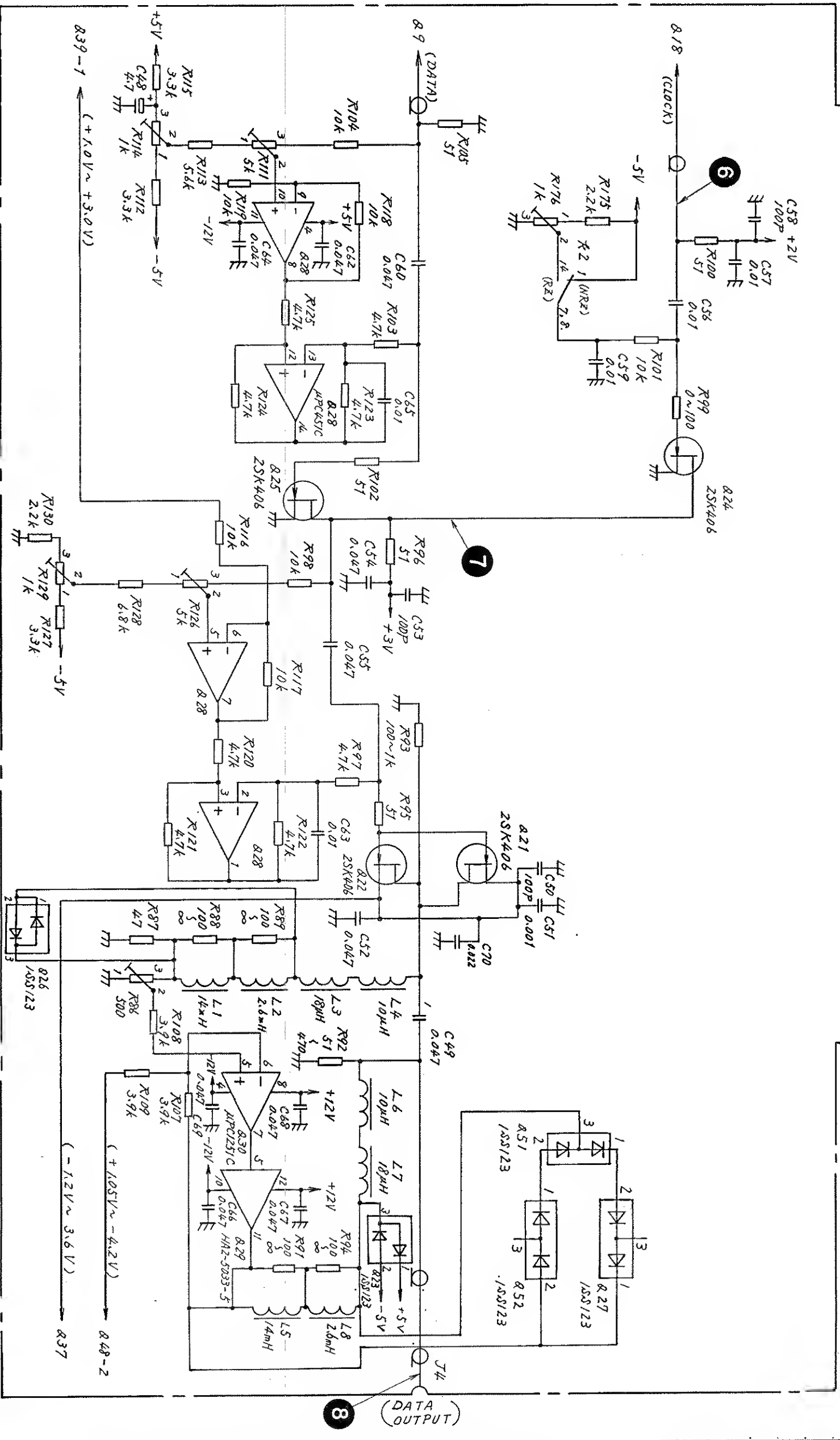
Parts Layout of MH676A Z1

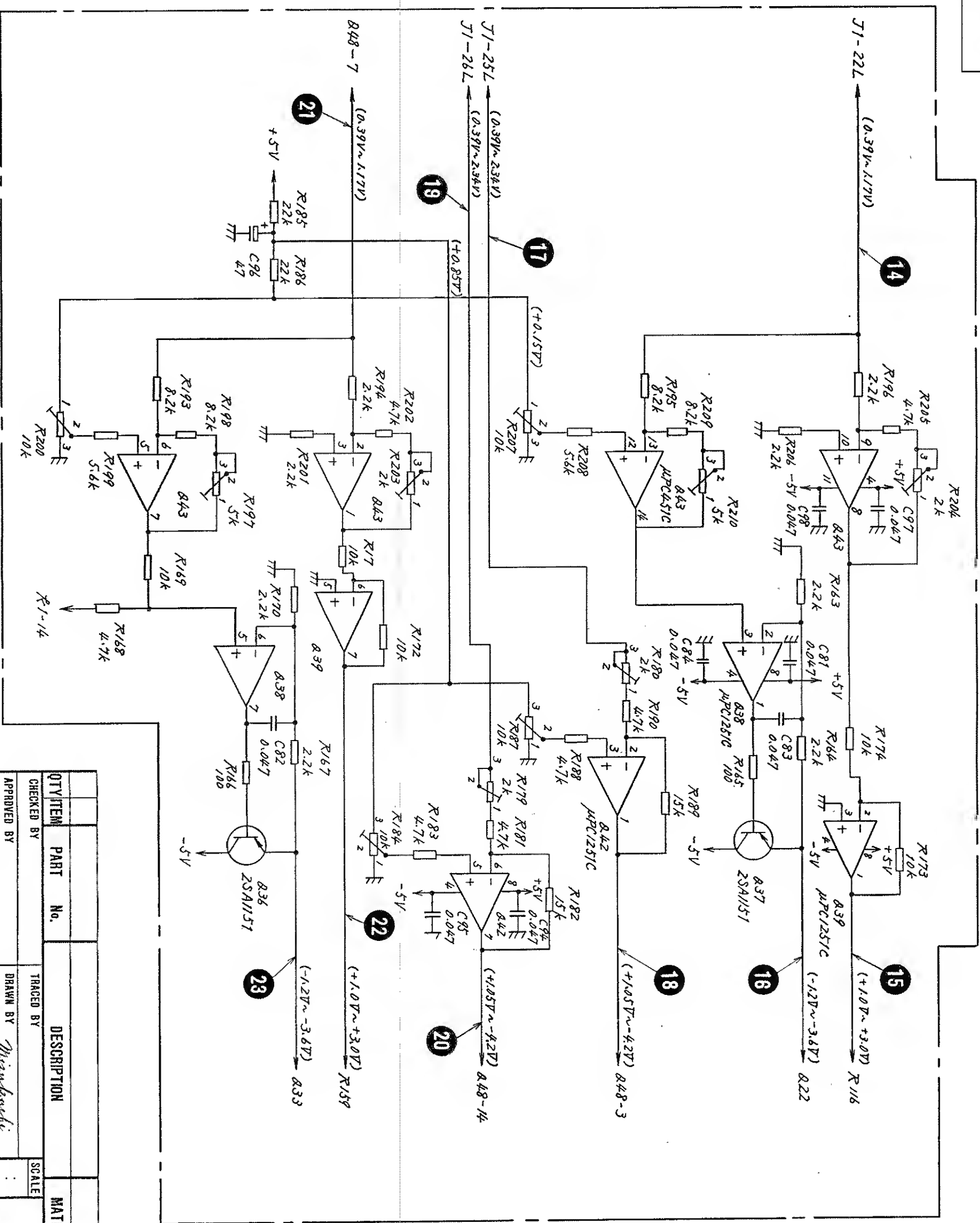
Mux Output PC Board 6



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DRAWING NO. 43 W 33610 1/5

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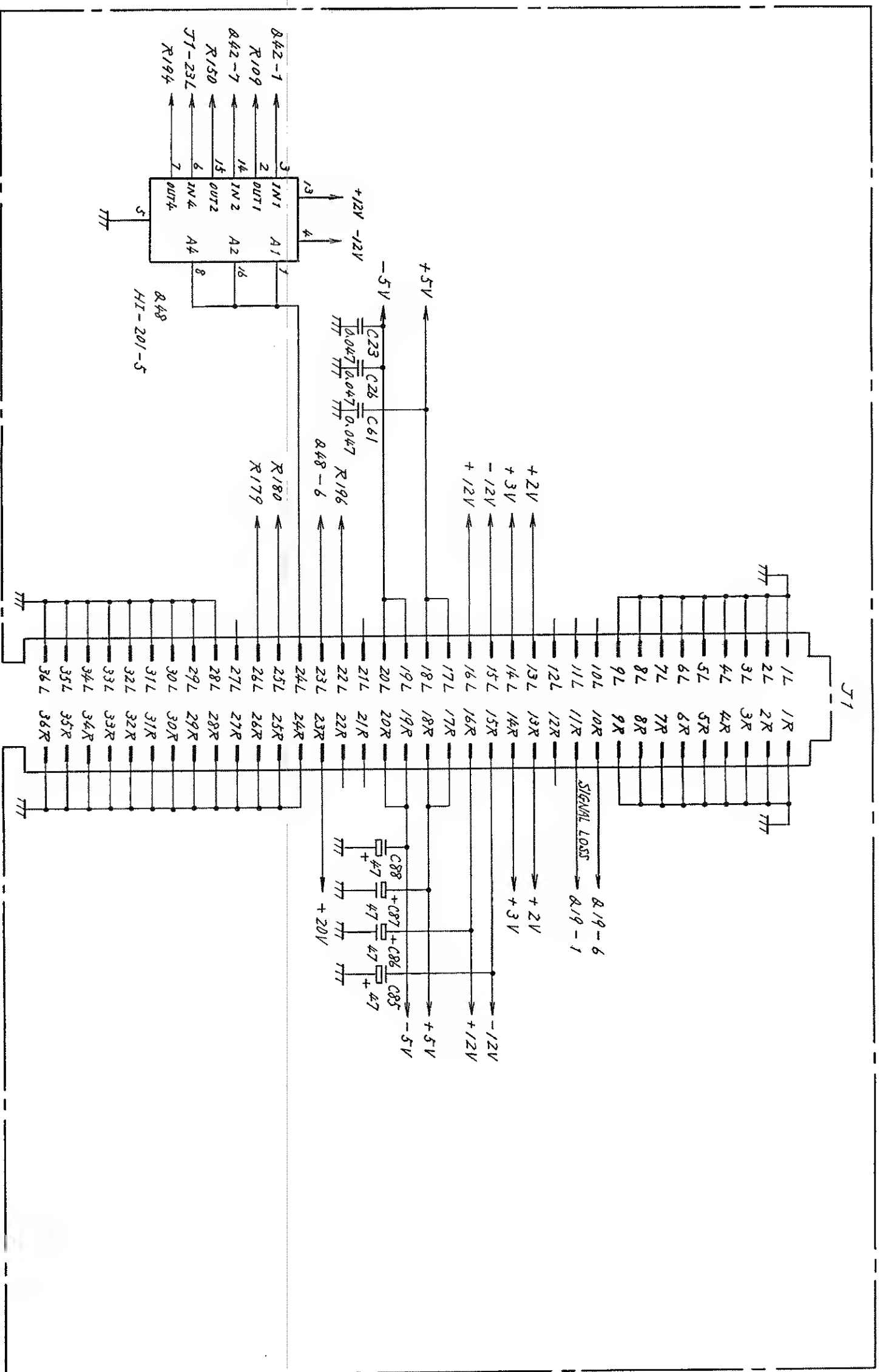
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APPROVED BY		DRAWN BY		
TITLE		DRAWING No.		

Z1 MUX OUTPUT Circuit Diagram.

43W33610

6



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QTY	ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH	
CHECKED BY				TRACED BY	SCALE		
APPROVED BY				DRAWN BY	<i>Mizukawa et al.</i>		
							6

Z1 MUX OUTPUT Circuit Diagram.

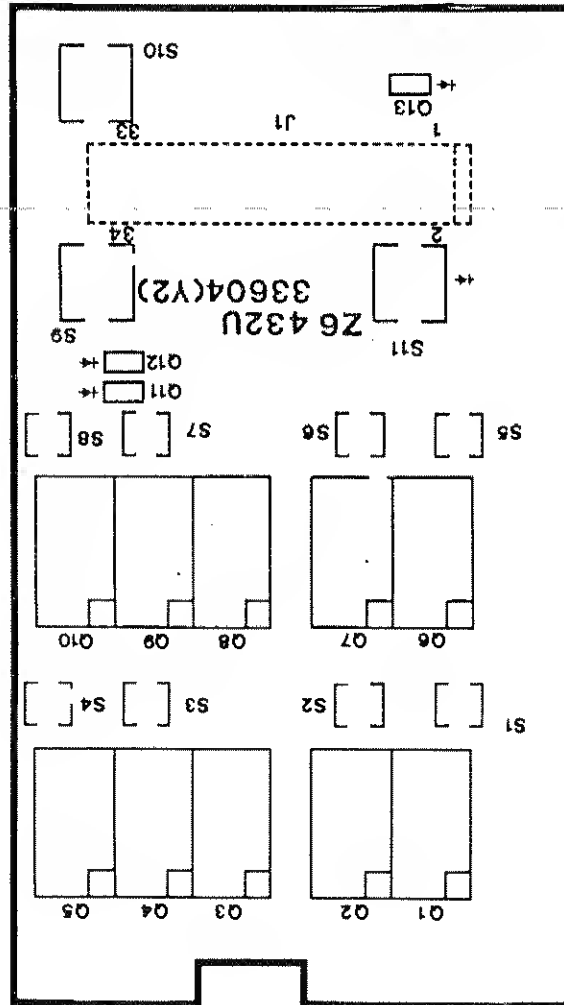
43 W 33610 $\frac{5}{5}$

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3-91

3.5.6 MH676A Z6 Display PC board 7, Z13 GP-1B 8
and Z14 RS-232C PC board 9

Fig. 3-33 Parts Layout of MH676A Z6 Display



APPLICATION

REVISIONS

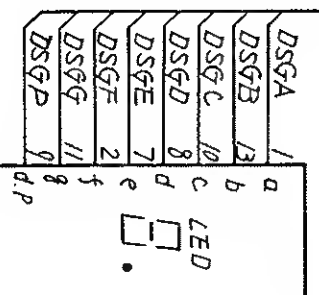
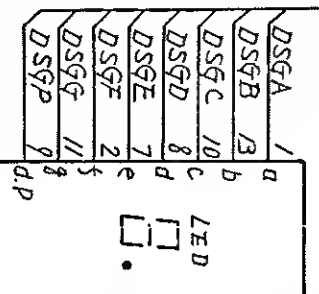
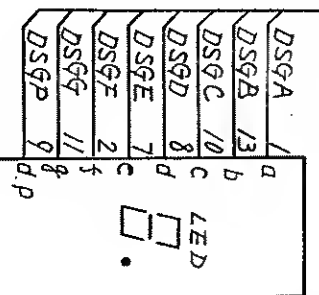
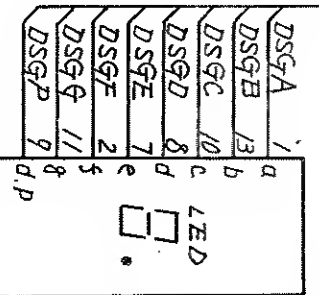
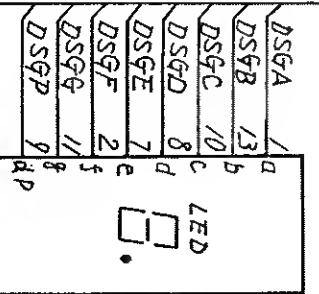
AMPLITUDE

CLOCK

OFFSET

Q1~Q10
LN5/36A

J1-11 DSGA
J1-12 DSGB
J1-13 DSGC
J1-14 DSGD
J1-15 DSGE
J1-16 DSGF
J1-17 DSGG
J1-18 DSGH

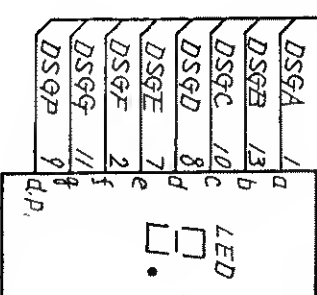
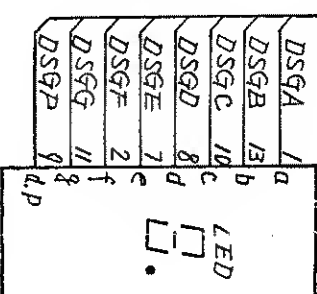
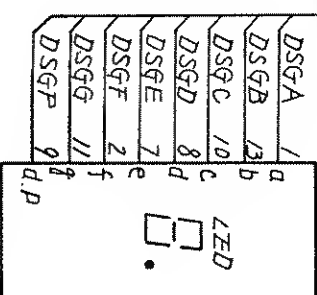
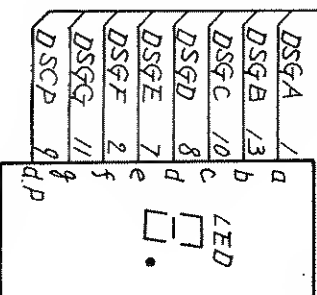
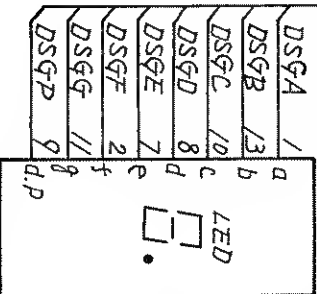


J1-19 ASG0
J1-20 ASG1
J1-21 ASG2
J1-22 ASG3
J1-23 ASG4
J1-24 ASG5
J1-25 ASG6
J1-26 ASG7
J1-27 ASG8
J1-28 ASG9

AMPLITUDE

DATA

OFFSET



432U33604

DEP

QTY/ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY		TRACED BY		
APPROVED BY		DRAWN BY		

7

Z6 DISPLAY Circuit Diagram

43 W 33615

1/2

No. 0023-1985-08

43 33615 1/2

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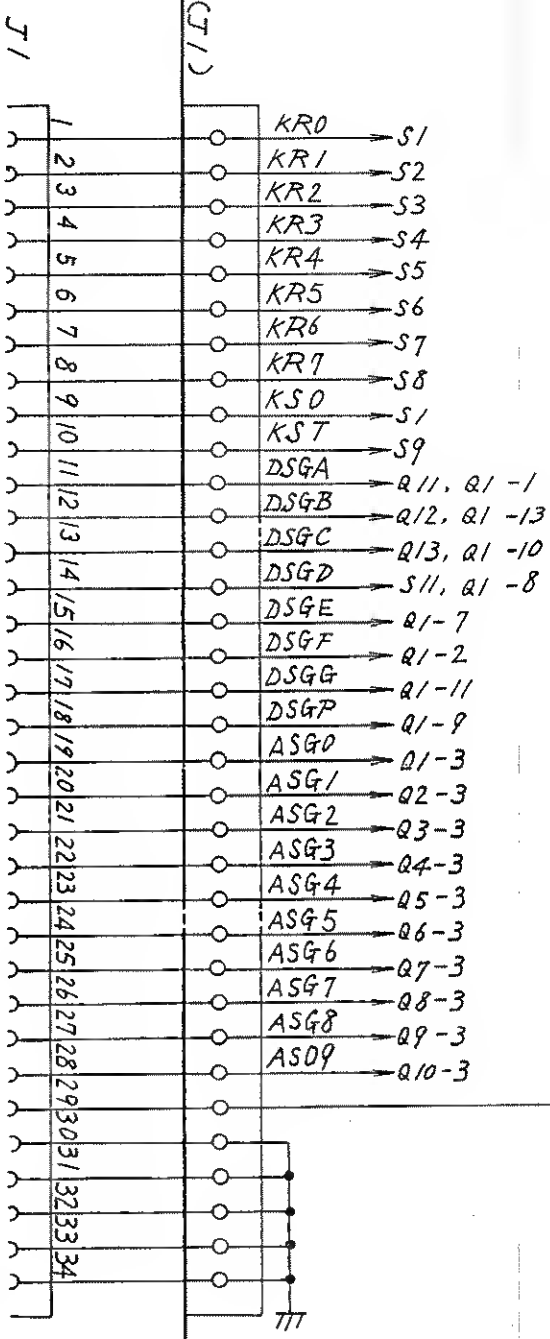
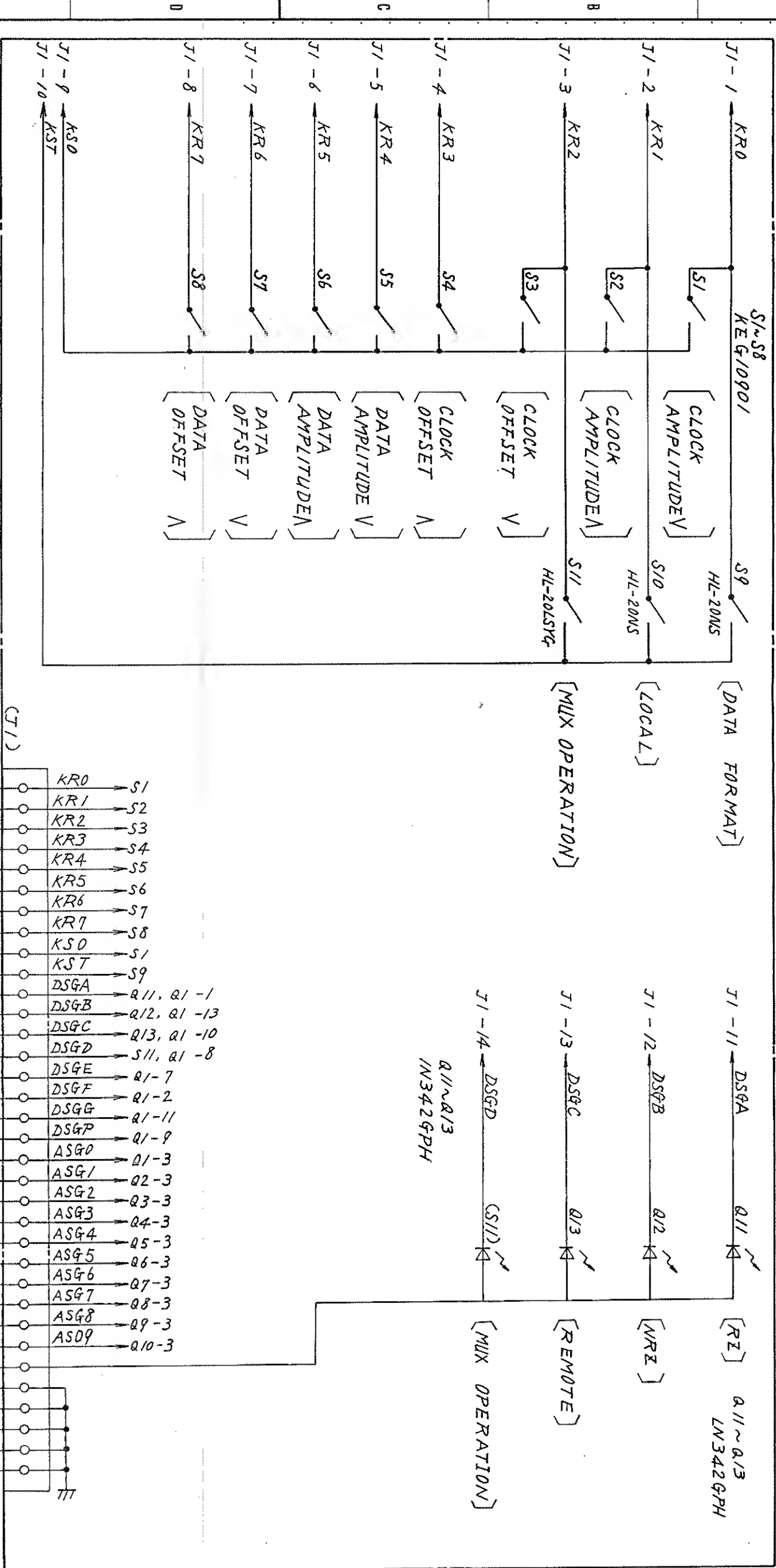


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APPLICATION

REVISIONS

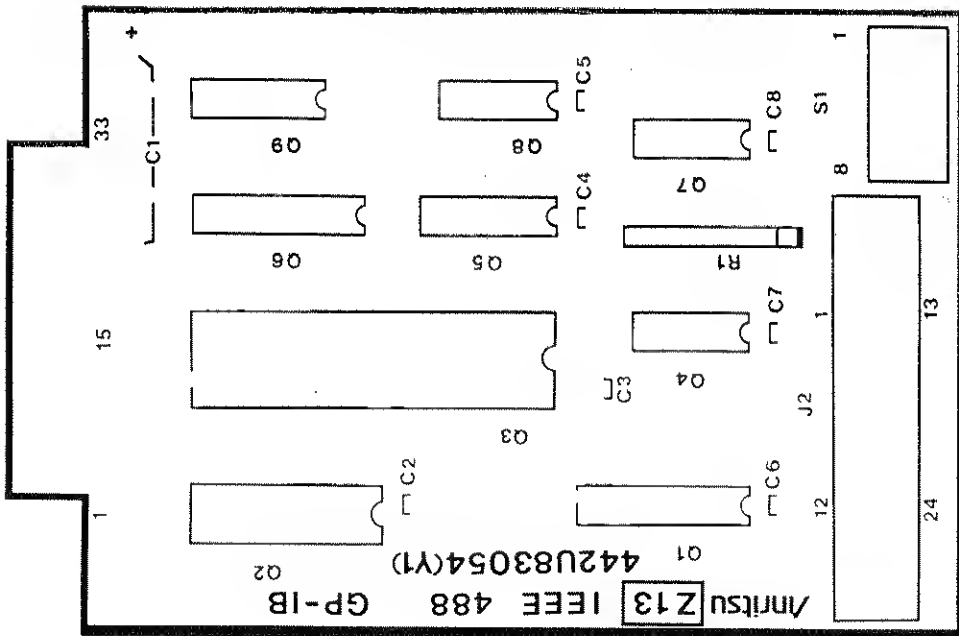


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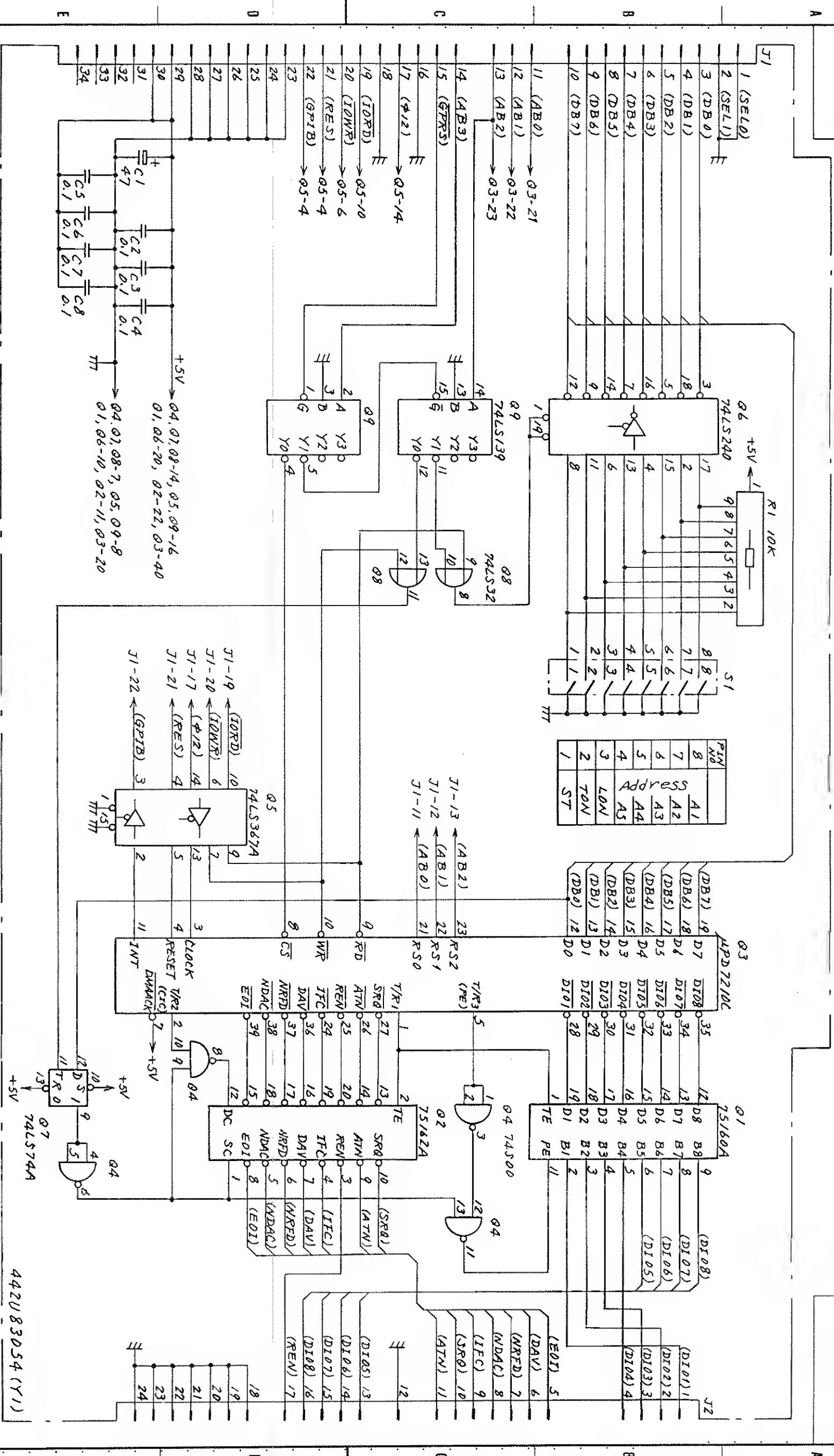
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APPROVED BY		DRAWN BY		
TITLE		DRAWING No.		
Z6 DISPLAY Circuit Diagram		43W33615		
		2/2		

7

Fig. 3-34 Parts Layout of Z13 GP-IB
PC Board 8



REVISIONS



parts list	44W83046
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DEP

QTY	ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH
	CHECKED BY		TRACED BY		SCALE	
	APPROVED BY		DRAWN BY		:	

8

No. D023-1985.08

ANRITSU CORP.

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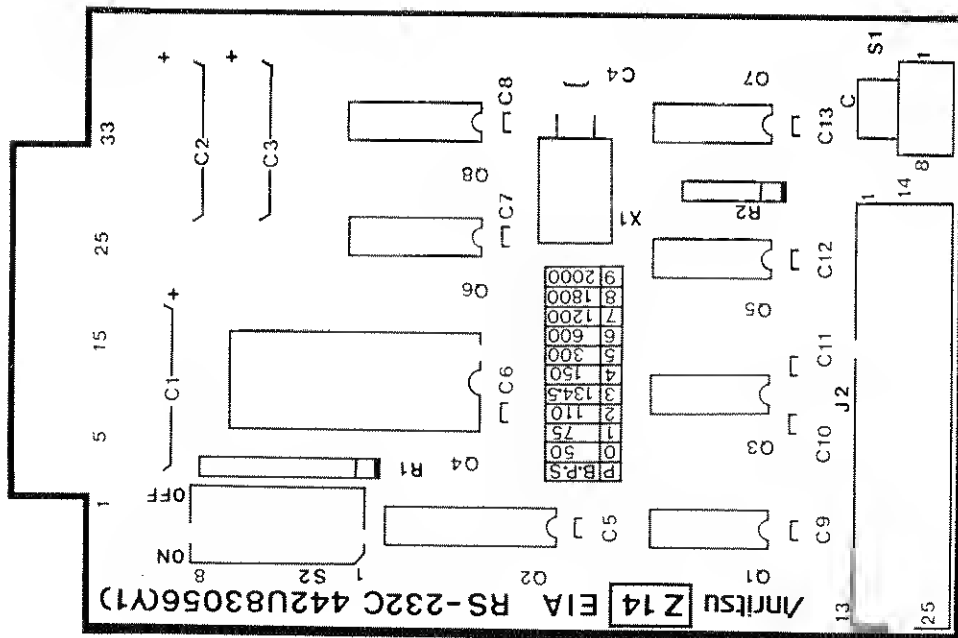
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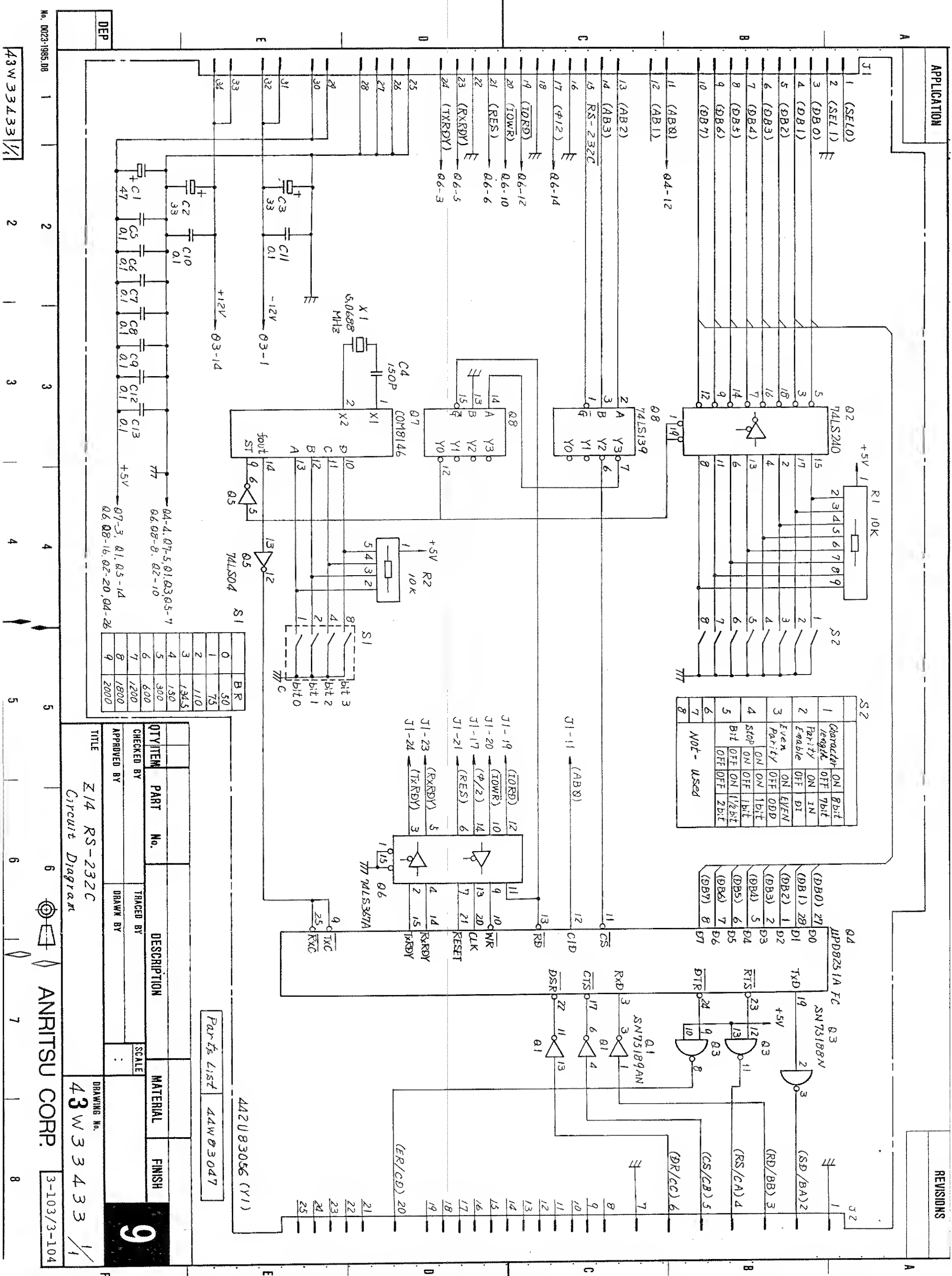
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Fig. 3-35 Parts Layout of Z14 RS-232C
PC Board 9





3.6 MH677A Troubleshooting

Figure 3-36 shows MH677A, block diagram which consists of PC boards Z1 to Z6 and Z13 or Z14 (listed in Table 3-4). The PC board functions are outlined as follows. See 3.6.1 to 3.6.6 for details.

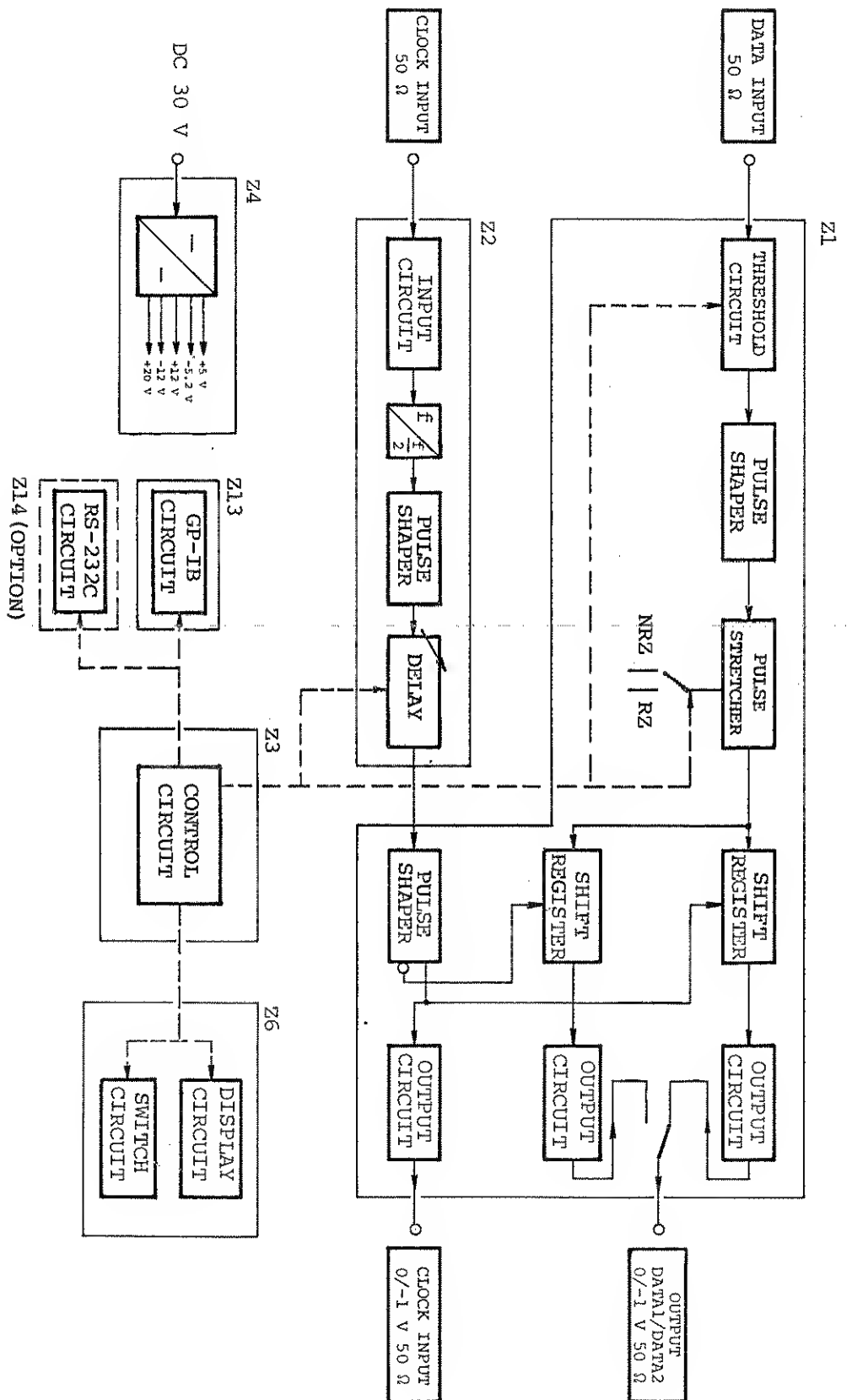


Fig. 3-36 MH677A DEMULTIPLEXER Block Diagram

- (1) Motherboard circuit (Z5)
The motherboard circuit receives dc power from the ME522A Transmitter, and supplies the power supply circuit (Z4).
It also transfers power and control signals between PC board Z1 to Z3.
- (2) Power supply circuit (Z4)
The power supply circuit generates various dc power voltages from the power received from the ME522A Receiver and Transmitter via the motherboard, and supplies the other PC boards.
- (3) Control circuit (Z3)
The control circuit receives switch operation signals from the display circuit (Z6) and converts them into control signals.
To generate display signals, DATA THRESHOLD and CLOCK PHASE ADJUST must be set and DATA FORMAT and OUTPUT must be switched for input signal, and display signals are generated.
This circuit also receives signals from the GP-IB or RS-232C circuit (Z13 or Z14) and converts them into control signals.
- (4) Multiplexer input circuit (Z2)
The multiplexer input circuit receives DATA1 and DATA2, and CLOCK signals from the transmitter and doubles their speeds.

(5) Multiplexer output circuit (Z1)

The multiplexer output circuit receives DATA and CLOCK signals from the multiplexer input circuit, shapes the waveform, and changes the data format (NRZ/RZ). The signals are then output at variable AMPLITUDE and OFFSET levels.

(6) Display circuit (Z6)

The display circuit displays the switch operation states and the AMPLITUDE and OFFSET levels according to control signals received from the control circuit.

(7) GP-IB circuit (Z13) or RS-232C circuit (Z14)

The GP-IB or RS-232C circuit receives signals from the external controller and converts them into interface signals for the control circuit.

Note:

See SECTION 2 for the mechanical configuration required for troubleshooting and adjustment.

(4) Clock delay circuit (Z2)

The clock delay circuit receives CLOCK input signals from the device under test (DUT), divides it into half (1/2), shapes the pulse, and delays the phase within a range of approx. 1 ms.

(5) Demultiplexer circuit (Z1)

The demultiplexer circuit receives DATA input signals from the DUT. After passing through the threshold circuit, pulse shaper, and pulse stretcher, the signals are retimed using CLOCK signals sent from the clock delay circuit for output as the DATA1 and DATA2 signals. DATA1 and DATA2 are switched to OUTPUT to enable signal input to the ME5522A Receiver with the CLOCK output signals.

(6) Display circuit (Z6)

The display circuit displays the switch operation states, CLOCK PHASE ADJUST, and DATA THRESHOLD

according to control signals send from the CONTROL circuit.

(7) GP-IB circuit (Z13) or RS-232C circuit (Z14)

The GP-IB or RS-232C circuit receives signals from an external controller and converts them into interface signals for the control circuit.

Note:

See SECTION 2 for the mechanical configuration required for troubleshooting.

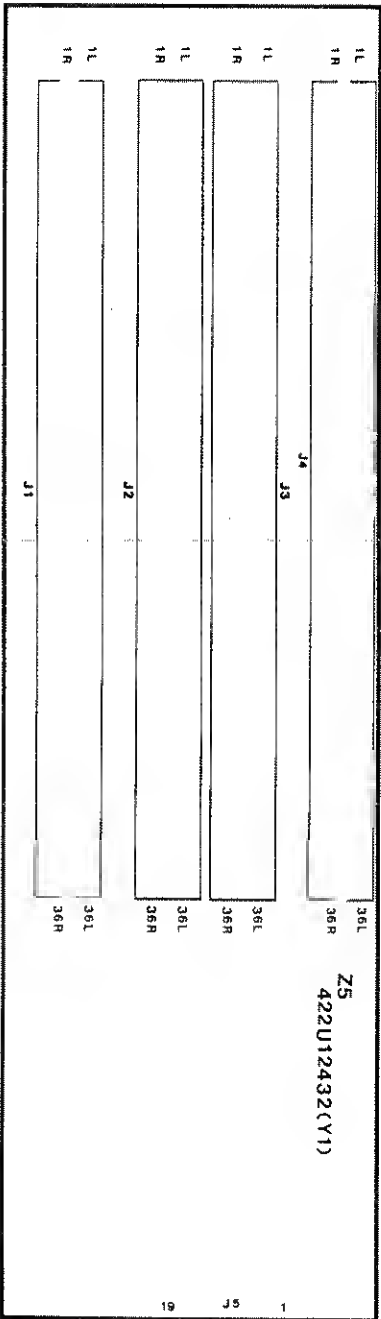
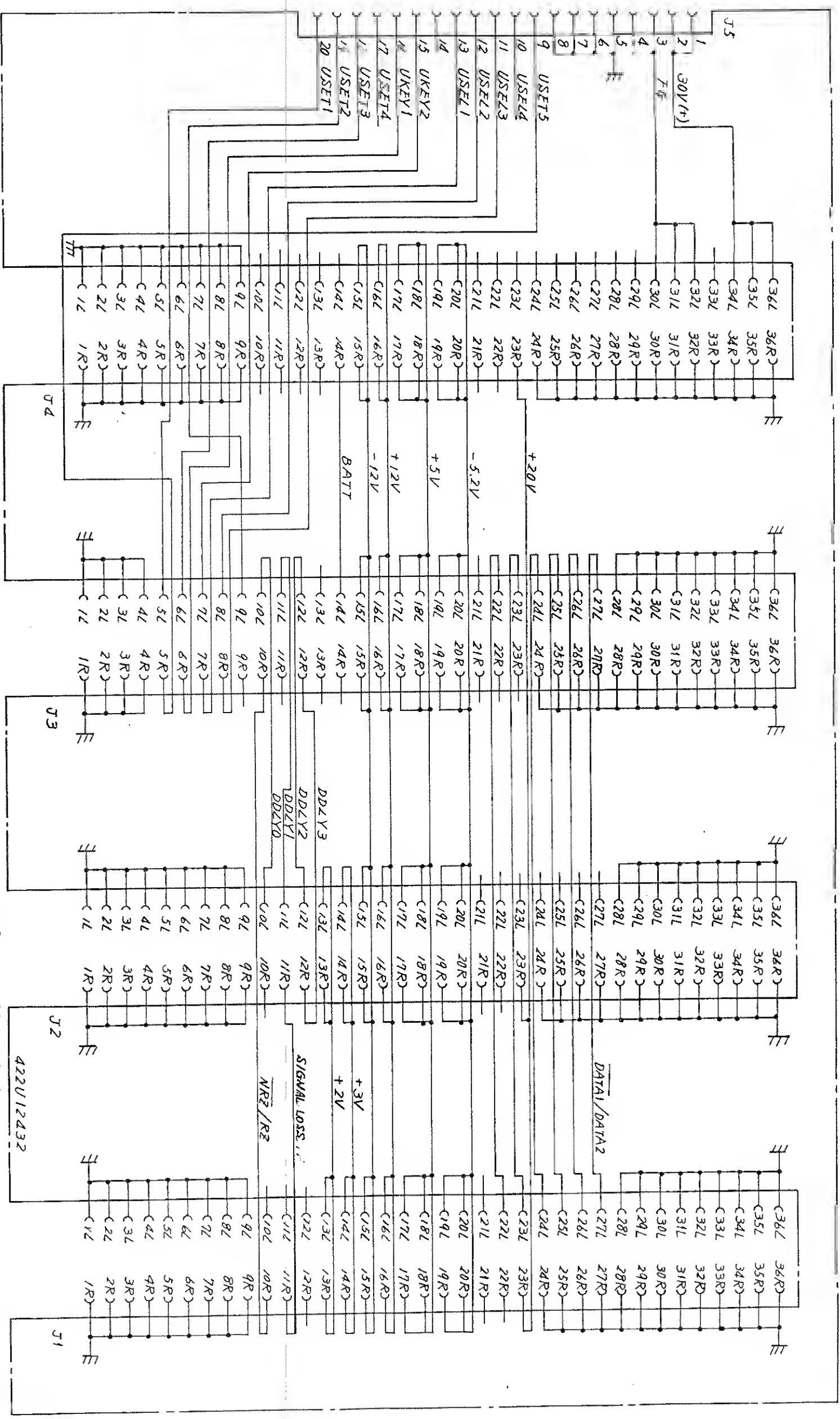


Fig. 3-37 Parts Layout of Z5 Motherboard PC Board



POWER SUPPLY

CONTROL

MUX INPUT or CLOCK DELAY

MUX OUTPUT or DEMUX

QTY	ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY				DRAWN BY	SCALE	
				<i>M. J. J. J.</i>		
APPROVED BY						

11

Parts List	44W83354
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Z5 MOTHER BOARD Circuit Diagram

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(1) Fuse replacement

Pull the MH677A out from the ME522A Receiver and remove the top cover according to the instructions given in paragraph 2.1.

Remove fuses F1 to F5 from the fuse holders on the Z4 PC board and replace them with new fuses (Fig. 3-38).

(2) Troubleshooting

- (a) Disconnect J2 to J6, J9, and J11 of the MH677A from J2 and J4 to J6 of PC board Z1, J2 and J3 of PC board Z3, and J1 and J2 of PC board Z3.
- (b) Disconnect PC boards Z1 to Z3 from J1 to J3 of PC board Z5.
- (c) Remove the PC board Z4 and insert the extender board where PC board Z4 was mounted then connect Z4 to the extender board.
- (d) See items (d) to (k) in paragraph 3.5.2, MH676A Troubleshooting, for details of troubleshooting.

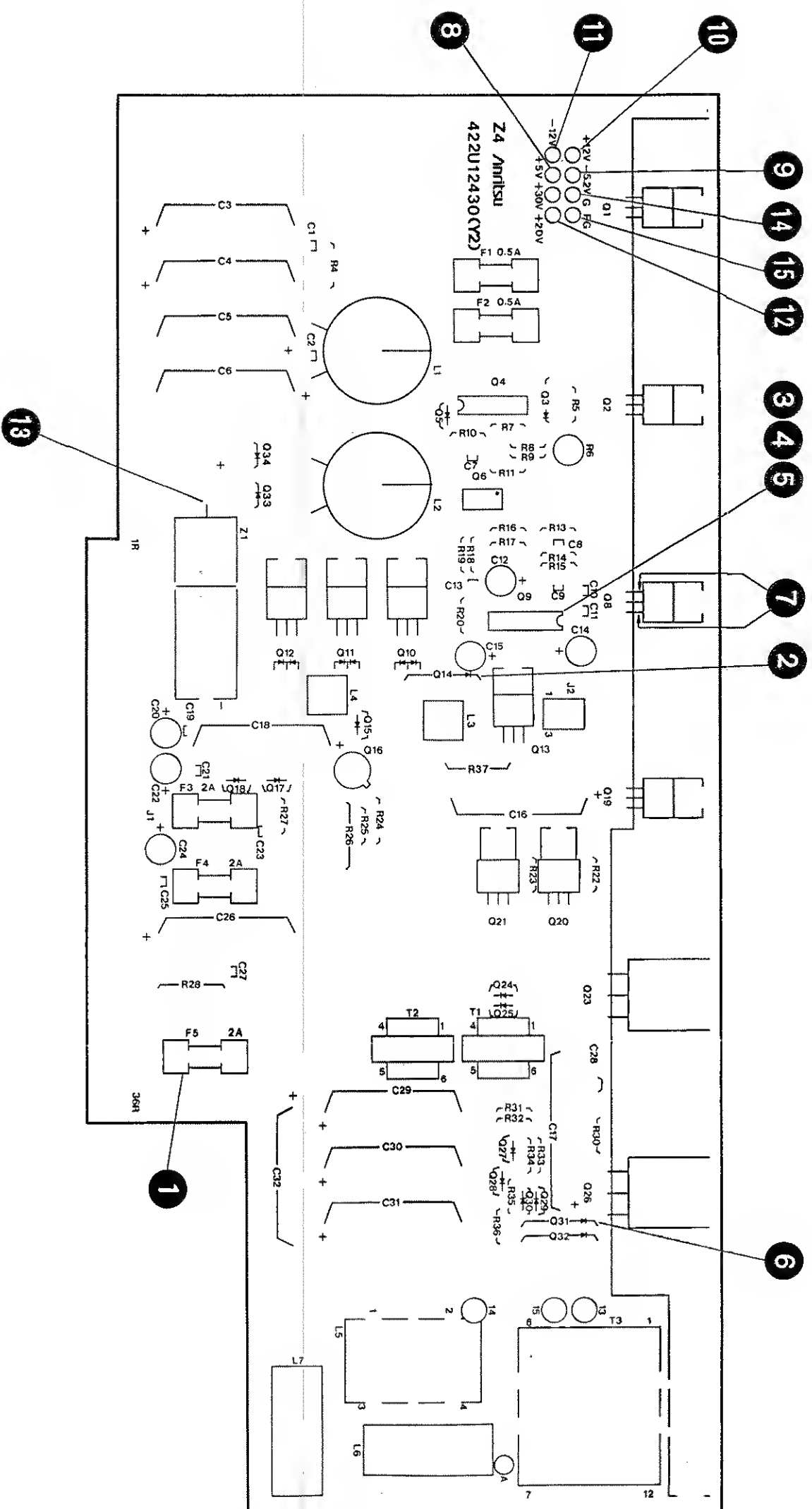
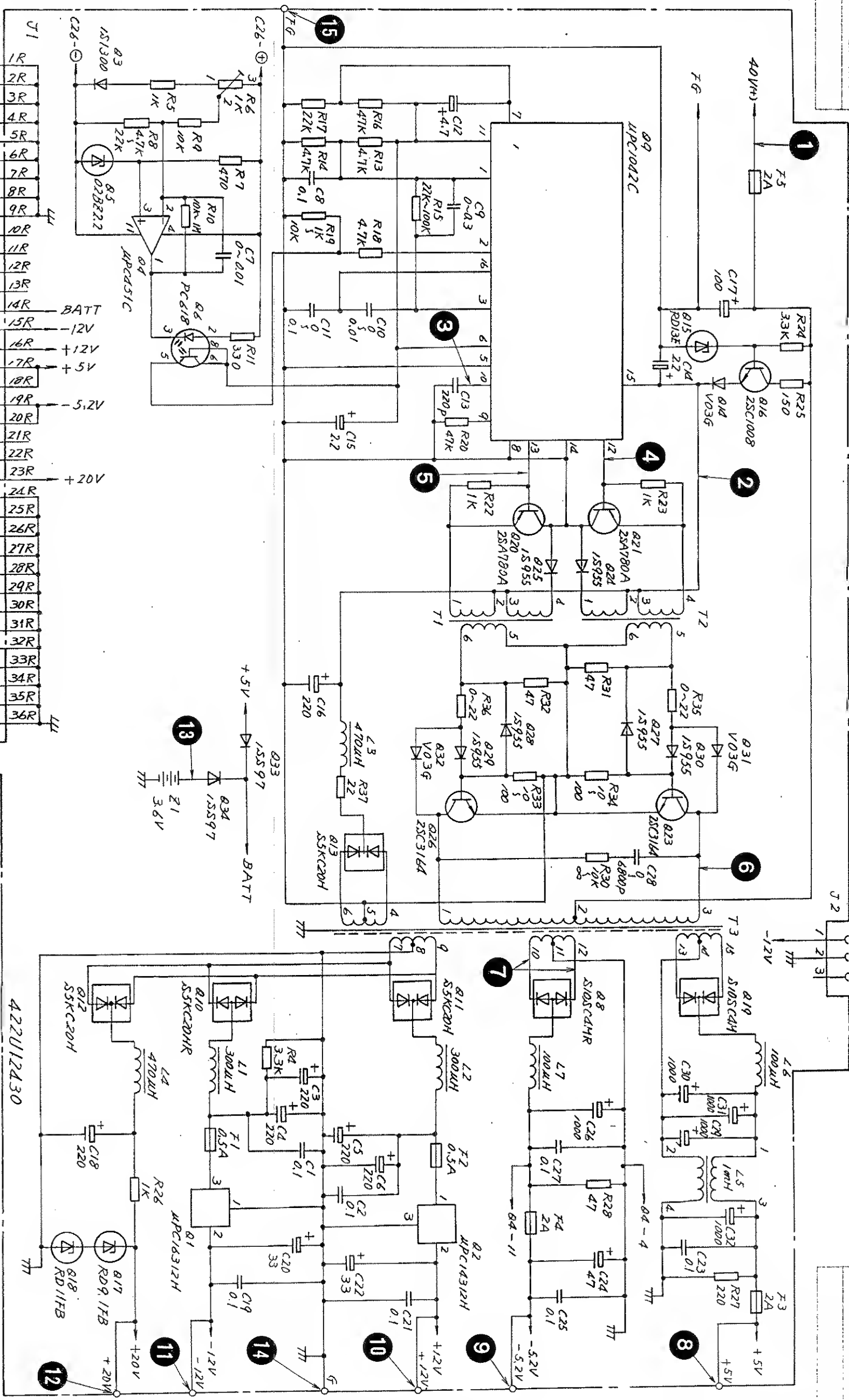


Fig. 3-38
Parts Layout of MH677A Z4
Power Supply PC Board **12**



1R	2R	3R	4R	5R	6R	7R	8R	9R	10R	11R	12R	13R	14R	15R	16R	17R	18R	19R	20R	21R	22R	23R	24R	25R	26R	27R	28R	29R	30R	31R	32R	33R	34R	35R	36R
1L	2L	3L	4L	5L	6L	7L	8L	9L	10L	11L	12L	13L	14L	15L	16L	17L	18L	19L	20L	21L	22L	23L	24L	25L	26L	27L	28L	29L	30L	31L	32L	33L	34L	35L	36L

BATT	-12V	+12V	+5V	-5.2V	+20V
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Parts List 44W 833 53

QTY/ITEM	PART NO.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY		TRACED BY		
APPROVED BY		DRAWN BY		
TITLE		DRAWING NO.		

Z4 POWER SUPPLY Circuit Diagram 43W 33 613

12

(1) Troubleshooting

- (a) See Items (a) to (d) in paragraph 3.5.3, MH676A Troubleshooting, for details of troubleshooting.
- (b) Measure the dc voltage at Z3 test point ⑥ with the panel set as follows:

Table 3-13 Dc voltages at Z3 Test Point ⑥

Panel setting	
DATE THRESHOLD	-0.5 V
	1.35 V
	+3.5 V
	2.9 V

The above table lists the standard values. The tolerance range is $\pm 10\%$. If the voltages are normal, no troubleshooting is required. If the voltages are abnormal, troubleshoot the circuits for Q10, Q11, and Q12.

- (c) Check the dc voltage, at Z3 test point ⑥ (pins 12, 14, 16, and 18 or Q18). If the voltages are normal, no troubleshooting is required. If the voltages are abnormal, troubleshoot the circuits for Q15 and Q18.

Table 3-14 DC Voltages at Z3 Test Point ⑩

Panel Setting				Q18 pin No.	
				12	14
				16	18
CLOCK PHASE ADJUST X 100ps	-5	L	L	L	L
	-4	H	L	L	L
	-3	L	H	L	L
	-2	H	H	L	L
	-1	L	L	H	L
	0	H	L	H	L
	1	L	H	H	L
	2	H	H	H	L
	3	L	L	L	H
	4	H	L	L	H
	5	L	L	H	H

Notes:

H is +2.4 V or more
L is +0.4 V or less

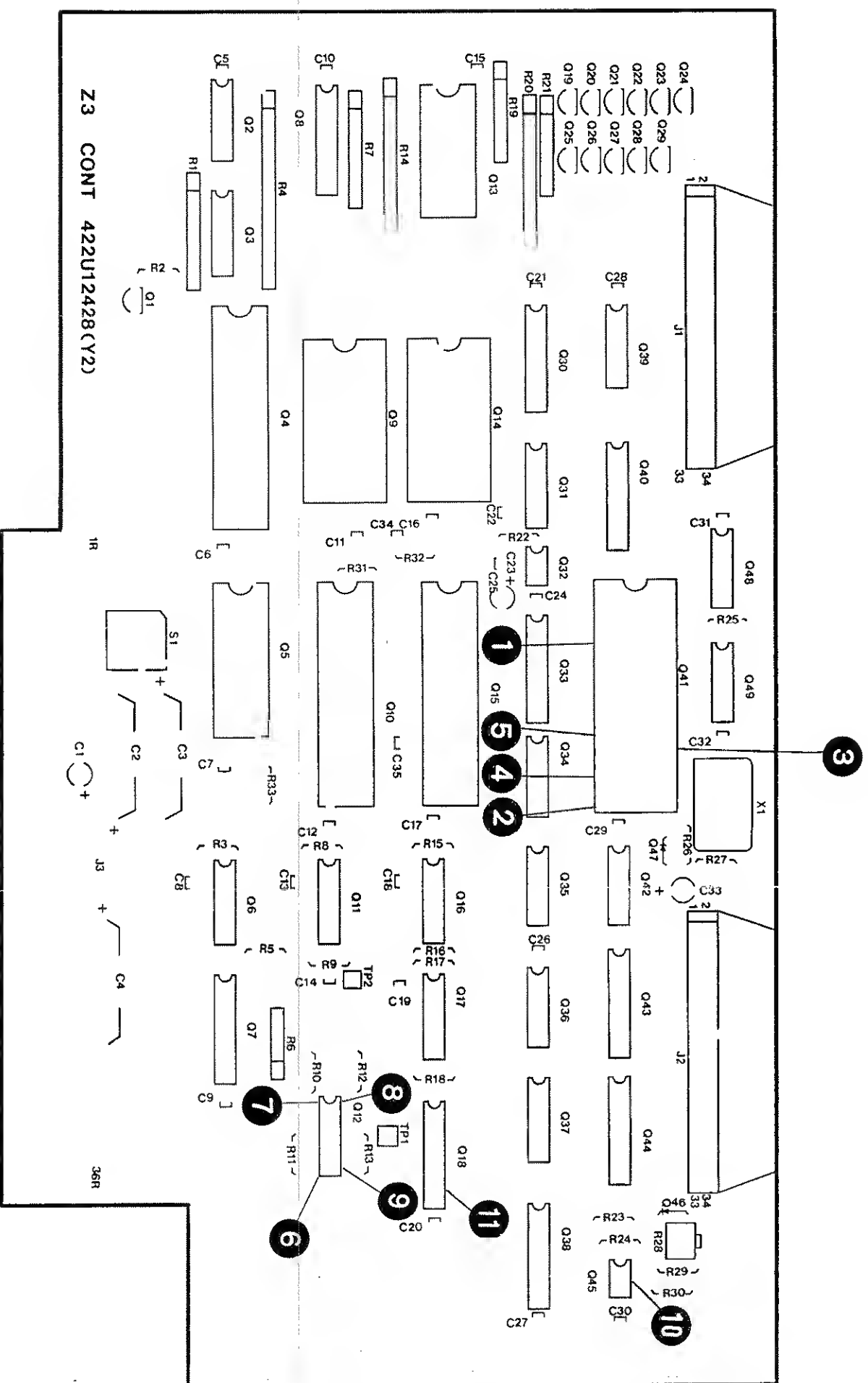
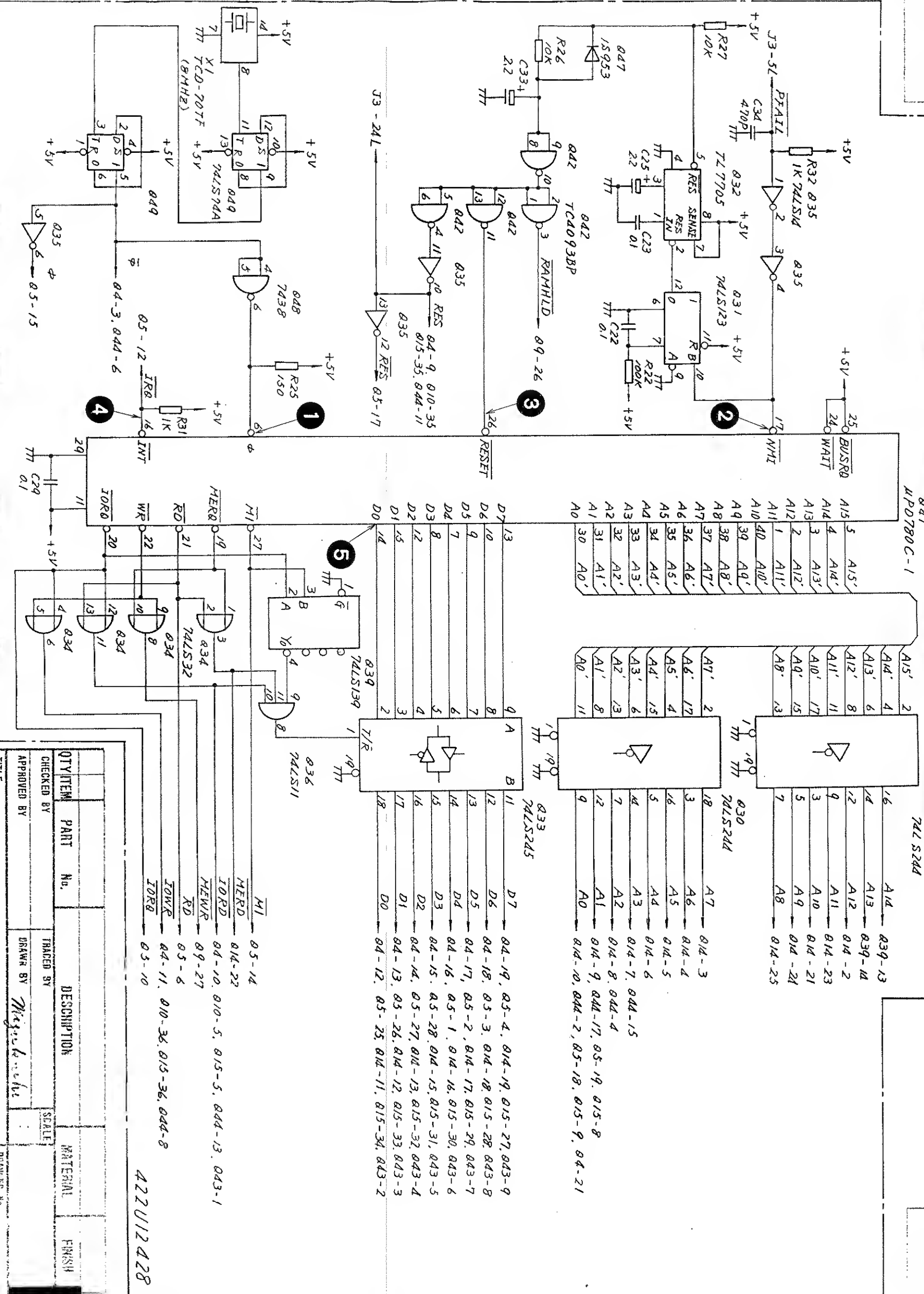


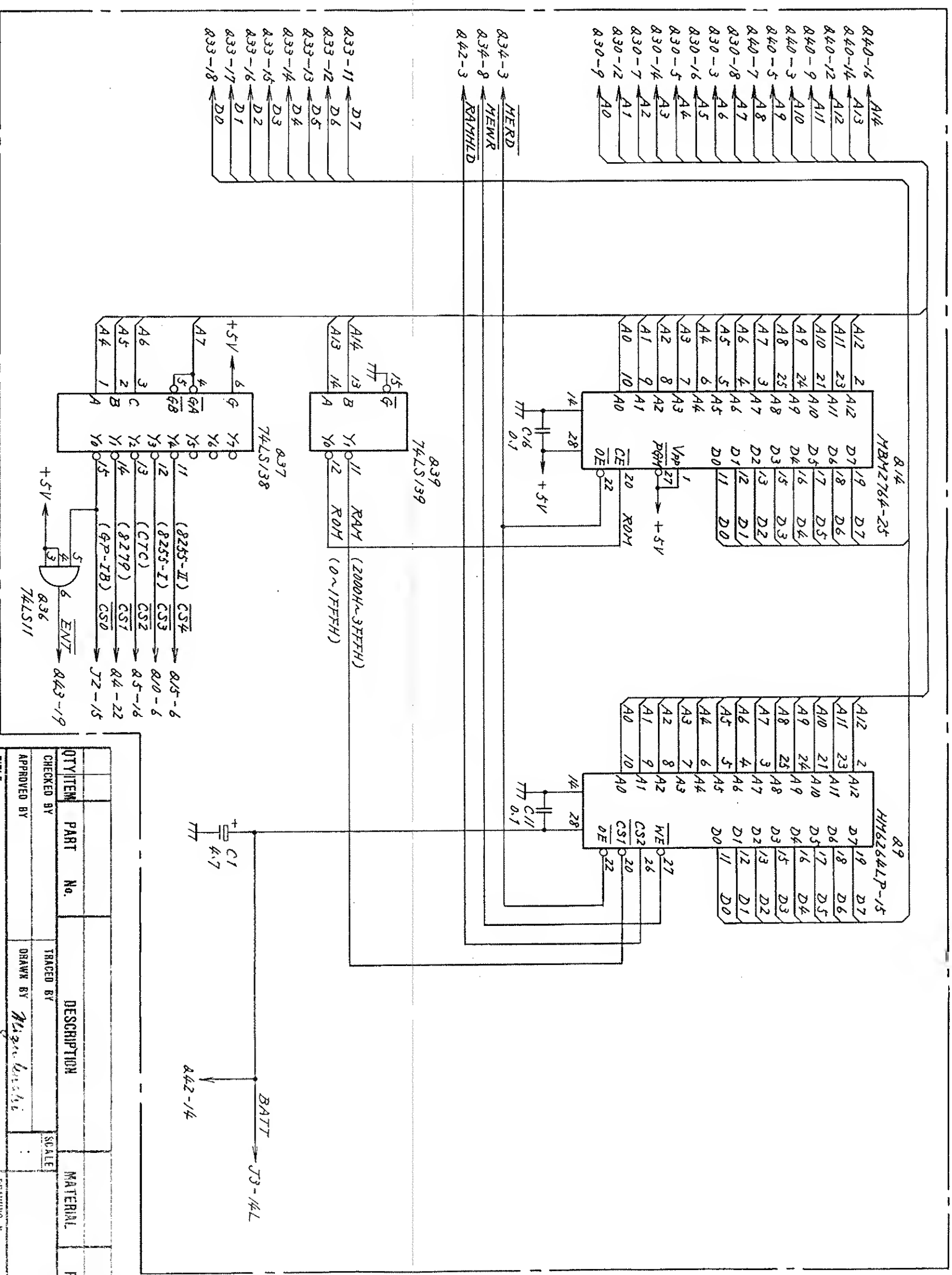
Fig. 3-39
 Parts Layout of MH677A Z3
 Control PC Board **13**
 3-121/(3-122 blank)



QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH
1	MPD780C-1	44W83352	MPD780C-1		
1	74LS244	44W83352	74LS244		
1	74LS245	44W83352	74LS245		
1	74LS139	44W83352	74LS139		
1	74LS138	44W83352	74LS138		
1	74LS137	44W83352	74LS137		
1	74LS136	44W83352	74LS136		
1	74LS135	44W83352	74LS135		
1	74LS134	44W83352	74LS134		
1	74LS133	44W83352	74LS133		
1	74LS132	44W83352	74LS132		
1	74LS131	44W83352	74LS131		
1	74LS130	44W83352	74LS130		
1	74LS129	44W83352	74LS129		
1	74LS128	44W83352	74LS128		
1	74LS127	44W83352	74LS127		
1	74LS126	44W83352	74LS126		
1	74LS125	44W83352	74LS125		
1	74LS124	44W83352	74LS124		
1	74LS123	44W83352	74LS123		
1	74LS122	44W83352	74LS122		
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1	74LS108	44W83352	74LS108		
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1	74LS3	44W83352	74LS3		
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1	74LS1	44W83352	74LS1		
1	74LS0	44W83352	74LS0		

13

DEP

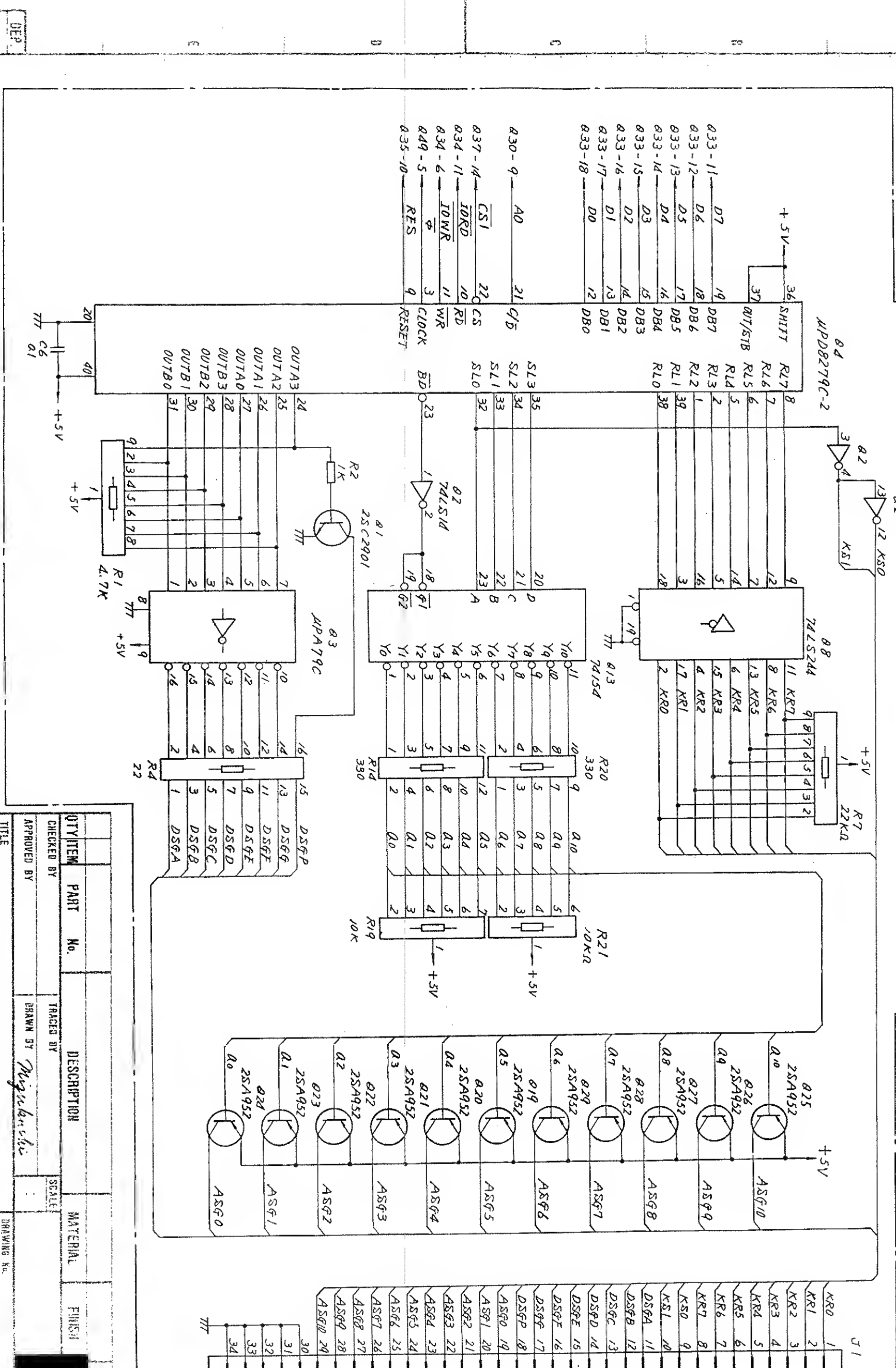


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13

TITLE Z3 CONTROL Circuit Diagram. 43W33612 2

ANRITSU CORP. 3-125/3-126



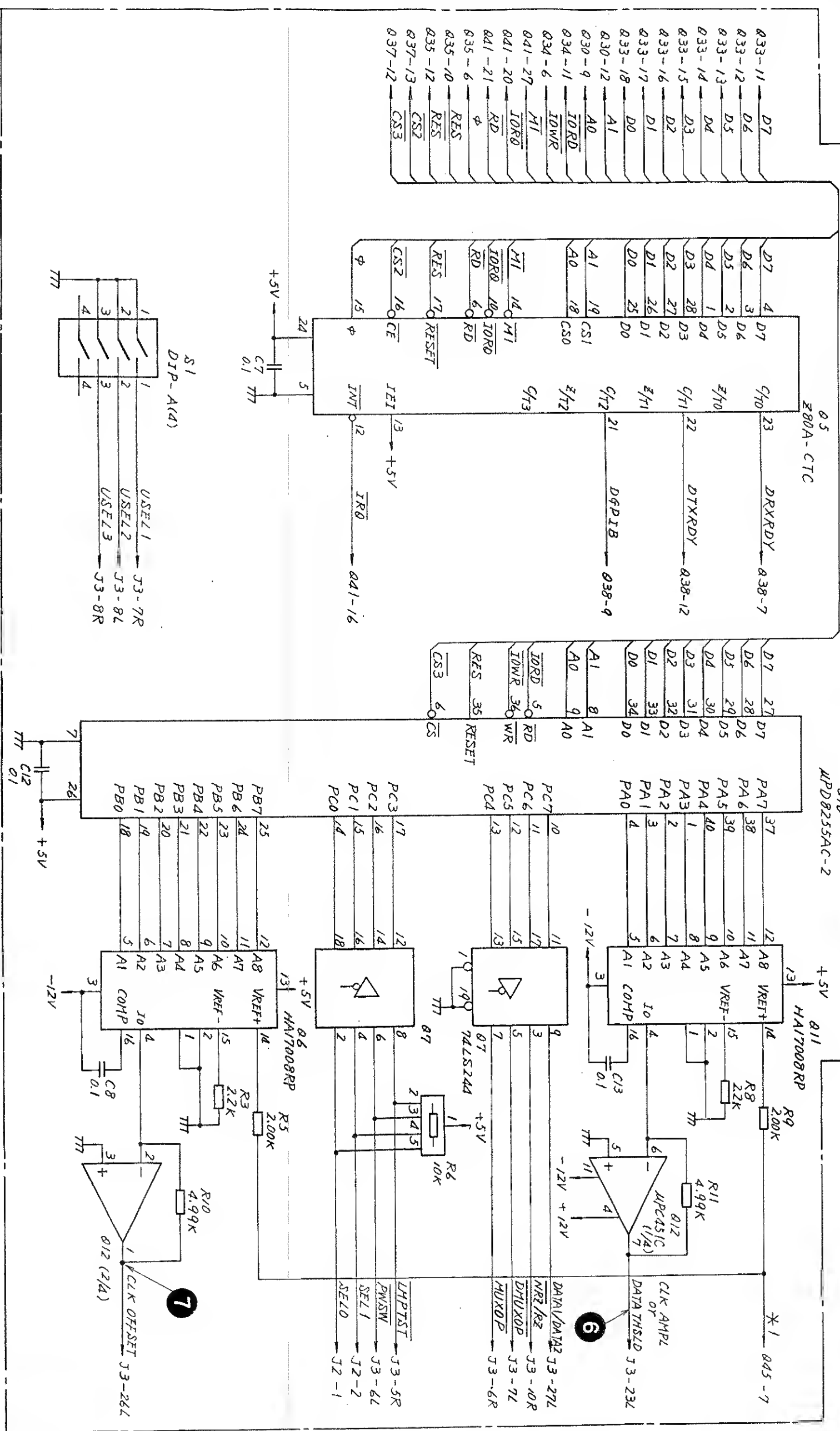
(DISPLAY Circuit)

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH
1	MPD8279C-2		Microprocessor		
1	74LS14		Hex Inverter		
1	74LS244		Octal Buffer		
1	74LS164		8-Bit Shift Register		
10	2SA952		Transistor		
10	ASG0-ASG9		LEDs		

DEP

TITLE
Z3 CONTROL Circuit Diagram

13



Note: Switch S1 Setting

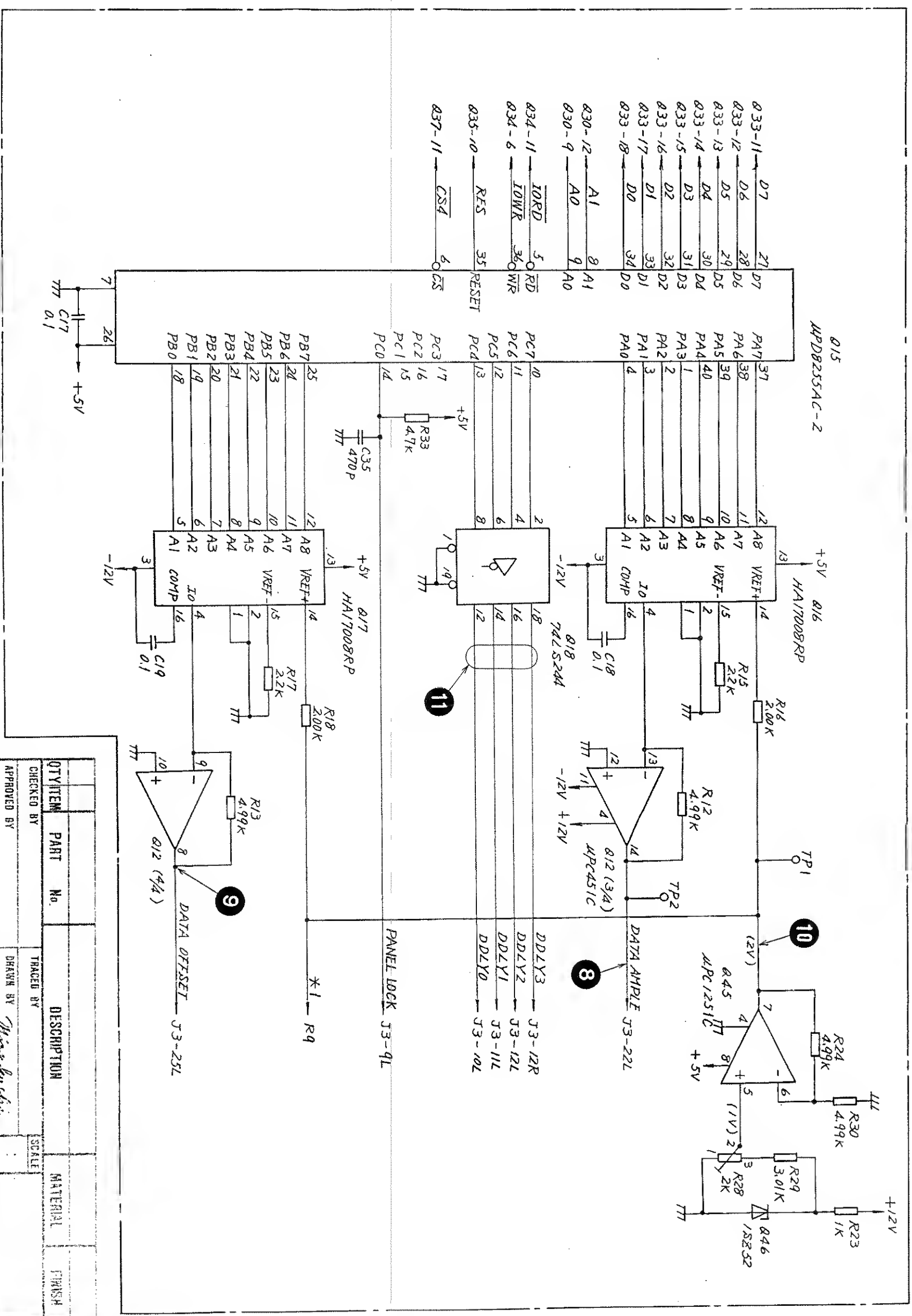
Unit	NO	1	2	3
HH 676A	ON	ON	ON	ON
HH 677A	OFF	ON	ON	ON

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH
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	APPROVED BY		DRAWN BY		
	TITLE				

13

Z3 CONTROL Circuit Diagram

ANRITSU CORP.

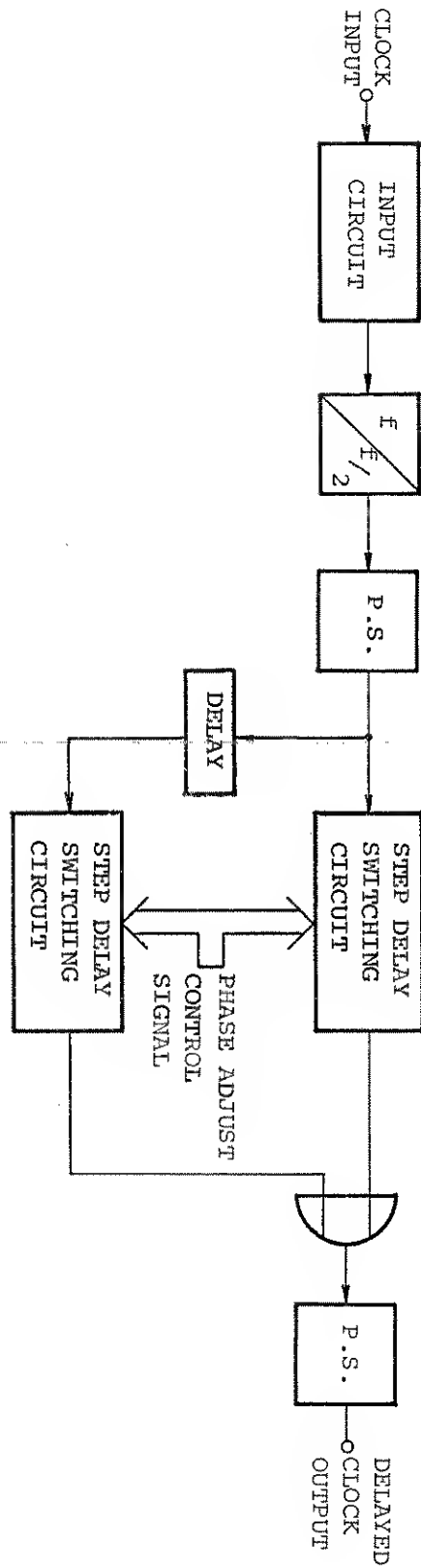


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	CHECKED BY			TRACED BY	SCALE	
	APPROVED BY			DRAWN BY		
				<i>M. J. K. K. K.</i>		



(1) circuit description

Figure 3-40 shows the Z2 Clock delay circuit block diagram. The CLOCK input signal is shaped and divided in half in the input circuit. The divided signal is branched into two signals, and the pulse is shaped for input to the step delay switching and delay circuits. The signal input to the delay circuit is transferred to the other step delay switching circuit. The step delay switching circuit is set by a phase adjustment control signal sent from the control PC board to generate a clock signal delayed in steps of approx. 100 ps. The signal is output after pulse-shaping.



P.S.: Pulse shaper

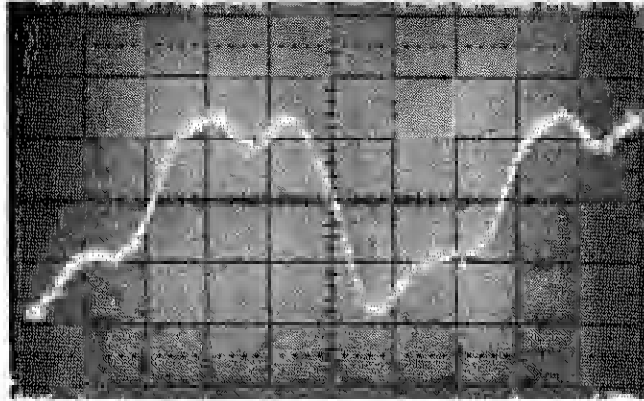
Fig. 3-40 MH677A Z2 CLOCK DELAY Block Diagram

(2) Troubleshooting

- (a) Disconnect all connectors connected to J2 and J3 of PC board Z2.
- Remove the PC board Z2 and insert the extender board where the Z2 PC board was mounted. Then connect Z2 to the extender board.
- Connect the DATA OUTPUT terminal of the MH676A to J2 of the MH677A PC board Z2 with a cable (SMA-P-RG58A/U-SMA-P 1 m coaxial cable).
- (b) Setting ME522A Transmitter, MH676A, and MH677A
1. ME522A Transmitter
Frequency: 350 MHz
PATTERN : PRBS 2³-1
LOAD : 50 Ω
LOGIC : Normal
 2. MH676A
Turn the power on with the LOCAL key held down to initialize the MH676A.
 3. MH677A
Turn the power on with the LOCAL key held down to initialize the MH677A.
- (c) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ①.
- If the waveform is as shown in Fig. 3-41, go to the next step. If the waveform is abnormal, troubleshoot the circuits for J2, Q4, and Q6, and the peripheral circuits.

Fig. 3-42 Waveform at Z3 Test Point ②

H: 0.5 ns/div
V: 0.2 V/div



(a) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ②. If the waveform is as shown in Fig. 3-42, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q7 and Q8, and the peripheral circuit.

Fig. 3-41 Waveform at Z2 Test Point ①

H: 0.5 ns/div
V: 0.5 V/div

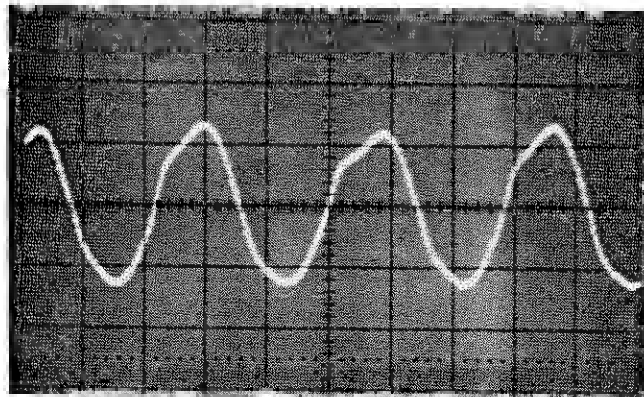
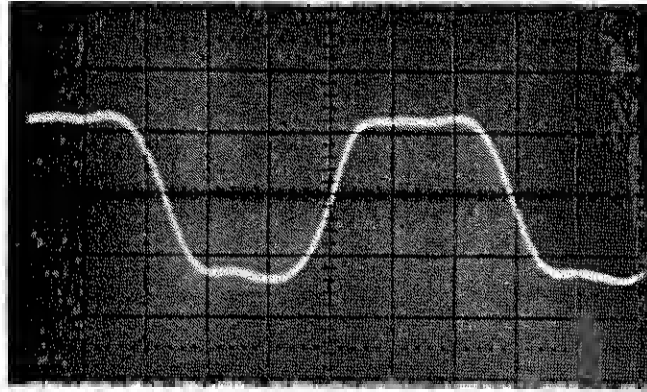


Fig. 3-43 Waveform at Z2 Test Point ⑥

H: 0.5 ns/div
V: 0.5 V/div



(f) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑥. If the waveform is as shown in Fig. 3-43, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q9 and Q16, and the peripheral circuits.

The above table lists the standard values. The tolerance range is $\pm 10\%$.

Dc Voltage			
③	④	⑤	⑥
+1.5 V	+2.0 V	-2.0 V	

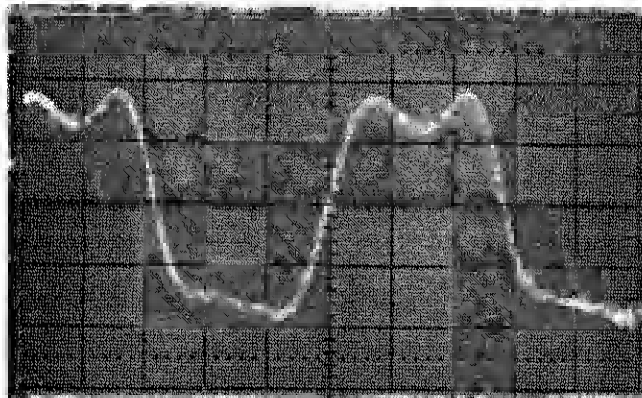
Table 3-15 Dc Voltages at Z2 Test Points ③, ④, and ⑤

(e) Use a dc voltmeter to measure the dc voltages at Z2 test points ③ to ⑤. If the voltages are as listed in Table 3-15, go to the next step. If the voltages are abnormal, troubleshoot the circuits for Q4 and Q31, and the peripheral circuits.

(g) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑦ .

If the waveform is as shown in Fig. 3-44, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q22 and Q34, and the peripheral circuit. See Item (h) for details of troubleshooting Q34.

Also, check that the waveform appears at Z3 test point ⑦ (even when the PHASE ADJUST setting is changed from -5 to 0.)



H: 0.5 ns/div
V: 0.5 V/div

Fig. 3-44 Waveform at Z2 Test Point ⑦

(h) Use a dc voltmeter to measure the dc voltage at Z2 test point ⑧ and check that the dc bias of the Q22 gate changes to High or Low as listed in Table 3-16 when PHASE ADJUST is set to 0 and except to 0 .

The dc biases of the Q17 to Q21 gates should also change in the same way as the Q22 gate when PHASE ADJUST is set from -5 to -1.

Table 3-16 Dc Voltages at Z2 Test Point ⑧

PHASE ADJUST: 0	Dc Voltage
except 0	⑧ at
	-0.4 to -0.7 V
	-1.6 to 2.0 V

- (i) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point. ⑨
- If the waveform is as shown in Fig. 3-45, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q24 to Q28, Q35, and Q36, and the peripheral circuits after performing the troubleshooting described in item (j).

Note that a waveform will only appear at ⑨ when PHASE ADJUST is set from 1 to 5.

The operation is similar to that described in items in (g) and (h). Therefore, it is necessary to check the dc bias changes in the Q24 to Q28 gates.

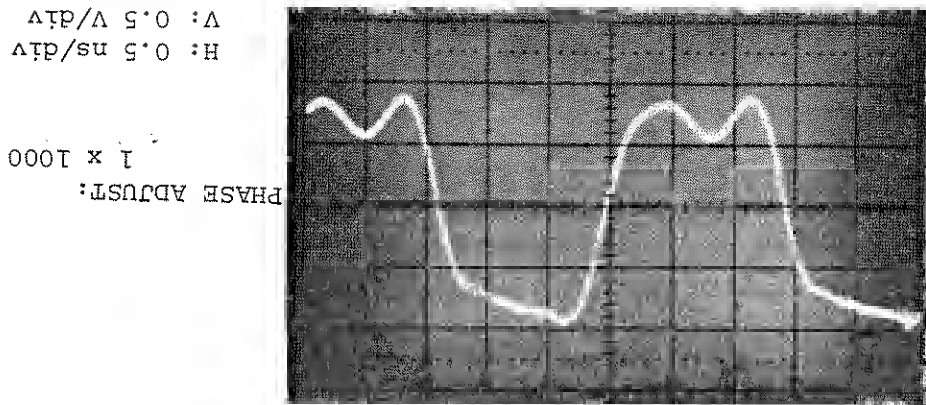
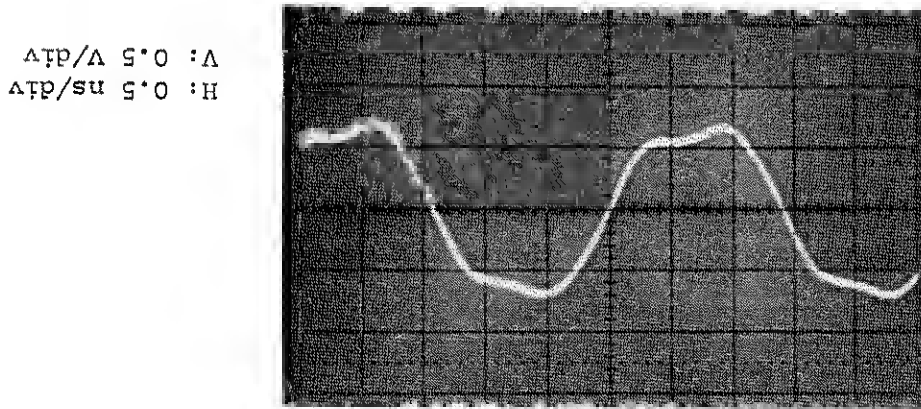


Fig. 3-45 Waveform at Z2 Test Point ⑨

If the waveform is as shown in Fig. 3-47, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q12 and Q34, and the peripheral circuits after performing the troubleshooting described in items (g) and (j).

(k) Use the sampling oscilloscope to check the waveform at Z2 test point ⑩.

Fig. 3-46 Waveform at Z2 Test Point ⑩



(j) Use the sampling oscilloscope with probe to check the waveform at Z2 test point ⑩. If the waveform is as shown in Fig. 3-46, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q9 and Q23, and the peripheral circuit.

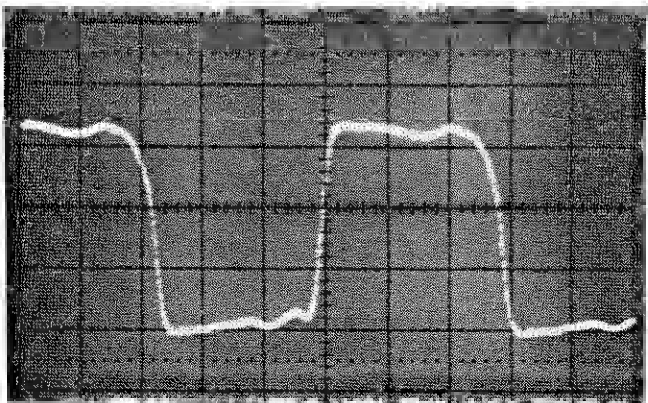
No clock signal	+0.6 to +0.8 V	+1.0 V to +1.2 V	-1.8 to -2.1 V
Clock signal	+0.6 to +0.8 V	+0.5 to +0.7 V	-0.4 to -0.7 V
Voltage at Q36 pins 4 and 10	Voltage at Q36 pins 5 and 11		
⑫	⑫		

Table 3-17 DC Voltages at Z2 Test Point ⑫

- (1) Use a dc voltmeter to measure the dc voltage at Z2 test point ⑫ and check that it is as listed in Table 3-17.
- If the voltage is abnormal, troubleshoot the circuits for Q4, Q5, and Q36, and the peripheral circuits. The voltages at pins 5 and 11 of Q36 and ⑫ change as listed in Table 3-13 when CLOCK signal input to the J2 of PC board Z2 is set to ON and OFF.

Fig. 3-47 Waveform at Z2 Test Point ⑪

H: 0.5 ns/div
V: 0.5 V/div



(m) Use a dc voltmeter to measure the dc voltages at Z2 test points ⑮ to ⑮ .

Table 3-18 lists the normal values.

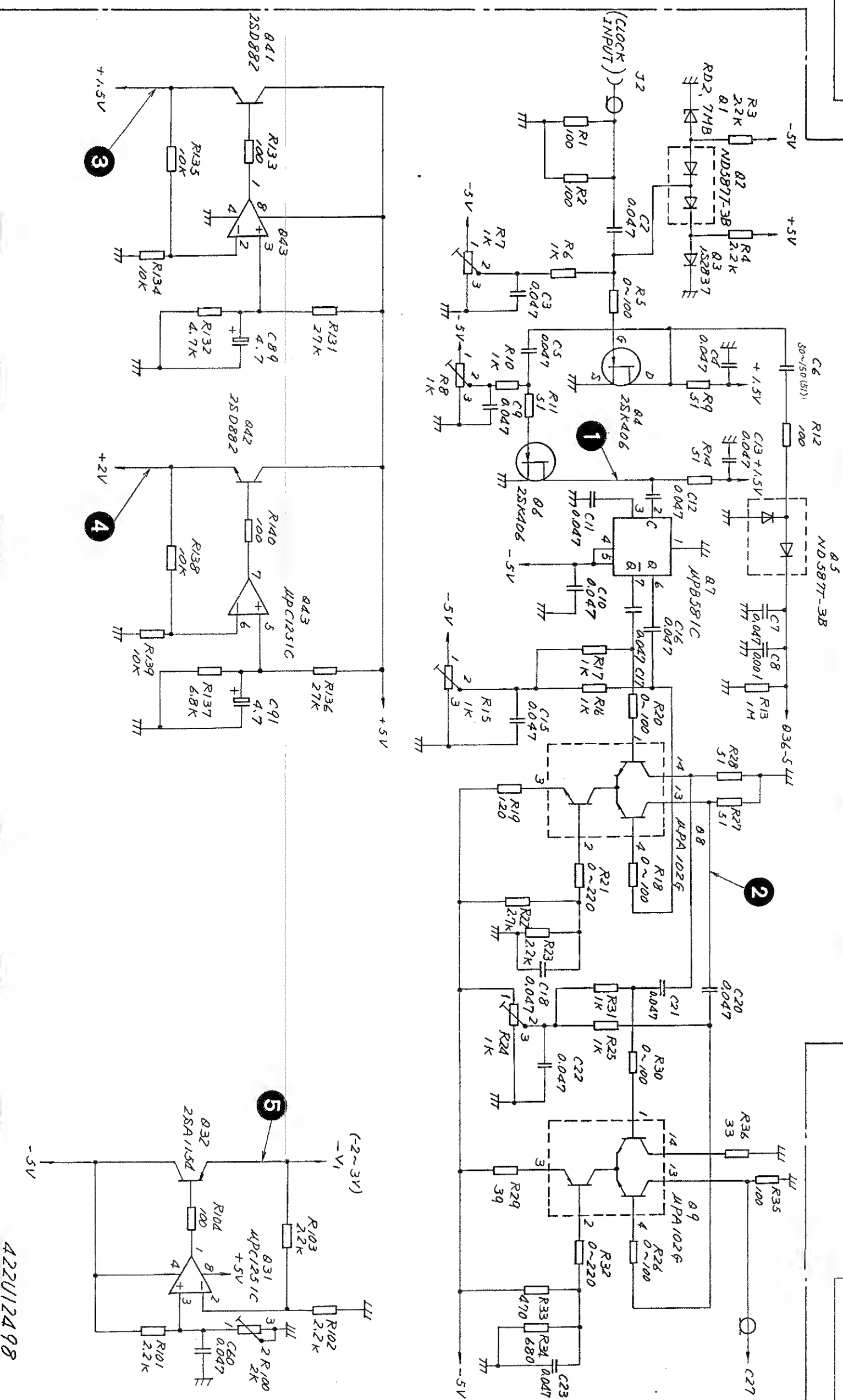
If the voltages are abnormal, troubleshoot the circuits from Q37 to Q40, and the peripheral circuits.

Table 3-18 Dc Voltages at Z2 Test Points ⑮ , ⑮ , and ⑮

PHASE ADJUST Setting														
	-5	-4	-3	-2	-1	0	1	2	3	4	5			
Q37 pin 23	L	H	L	H	L	H	L	H	L	H	L			
Q37 pin 22	L	L	H	H	L	L	H	H	L	L	H			
Q37 pin 21	L	L	L	H	H	H	H	H	L	L	L			
Q37 pin 20	L	L	L	L	L	L	L	L	L	L	L			
Q37 pin 1	L	H	L	H	L	H	L	H	L	H	L			
Q37 pin 2	H	L	H	H	H	H	H	H	H	H	H			
Q37 pin 3	H	H	L	H	H	H	H	H	H	H	H			
Q37 pin 4	H	H	H	L	H	H	H	H	H	H	H			
Q37 pin 5	H	H	H	H	L	H	H	H	H	H	H			
Q37 pin 6	H	H	H	H	H	L	H	H	H	H	H			
Q37 pin 7	H	H	H	H	H	H	L	H	H	H	H			
Q37 pin 8	H	H	H	H	H	H	H	L	H	H	H			
Q37 pin 9	H	H	H	H	H	H	H	H	L	H	H			
Q37 pin 10	H	H	H	H	H	H	H	H	H	L	H			
Q37 pin 11	H	H	H	H	H	H	H	H	H	H	L			
Q40 pin 6	L	L	L	L	L	L	L	L	L	L	L			
Q40 pin 8	H	H	H	H	H	H	H	H	H	H	L			

Notes:

H is +5 V \pm 0.5 V or less
L is +0.4 V or less



422U12498

OEP

QTY/ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY	TRACED BY	SCALE			
APPROVED BY	DRAWN BY				
TITLE			DRAWING No.		

Z2 CLOCK DELAY Circuit Diagram

43W33619

14

No. 0023-1985, D8

43W33619 1/5

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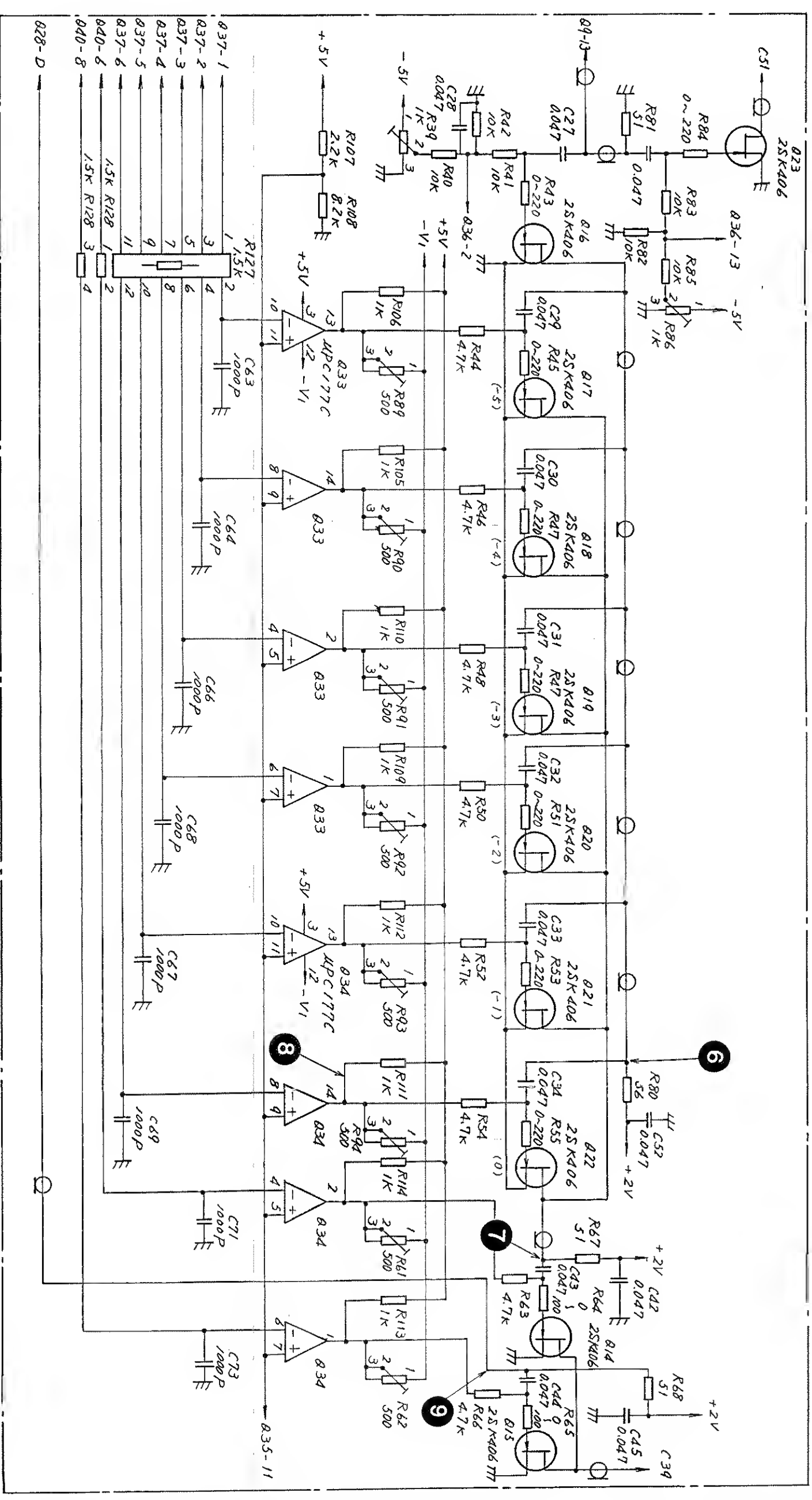
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3-147/3-148



QEP

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TITLE

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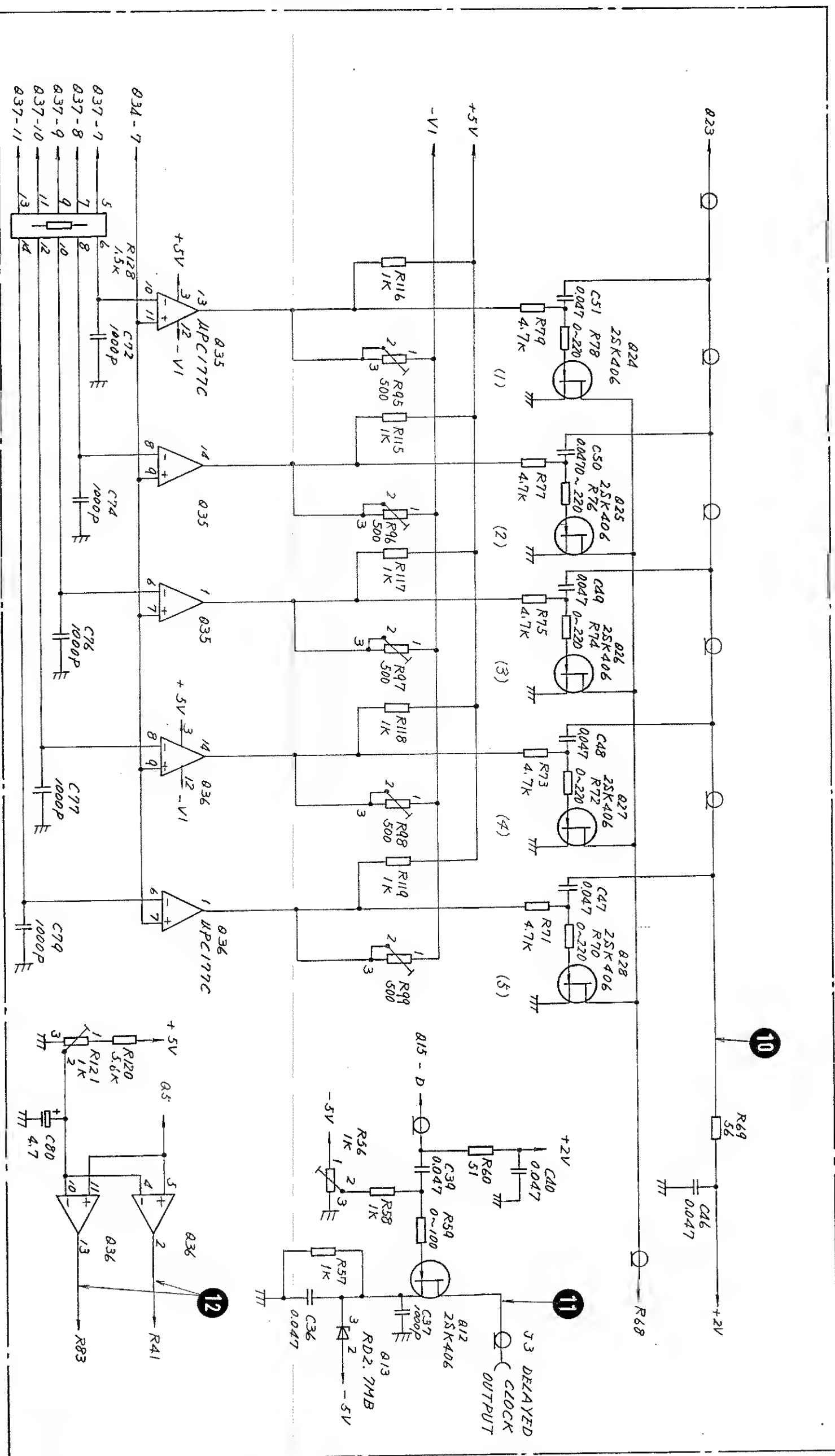
Z2 CLOCK DELAY Circuit Diagram

43W33619

14



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DEP

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TITLE		DRAWING No.		
Z2. CLOCK DELAY Circuit Diagram		43W33619 3/5		

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No. D023-1985 DB

43W33619 3/5

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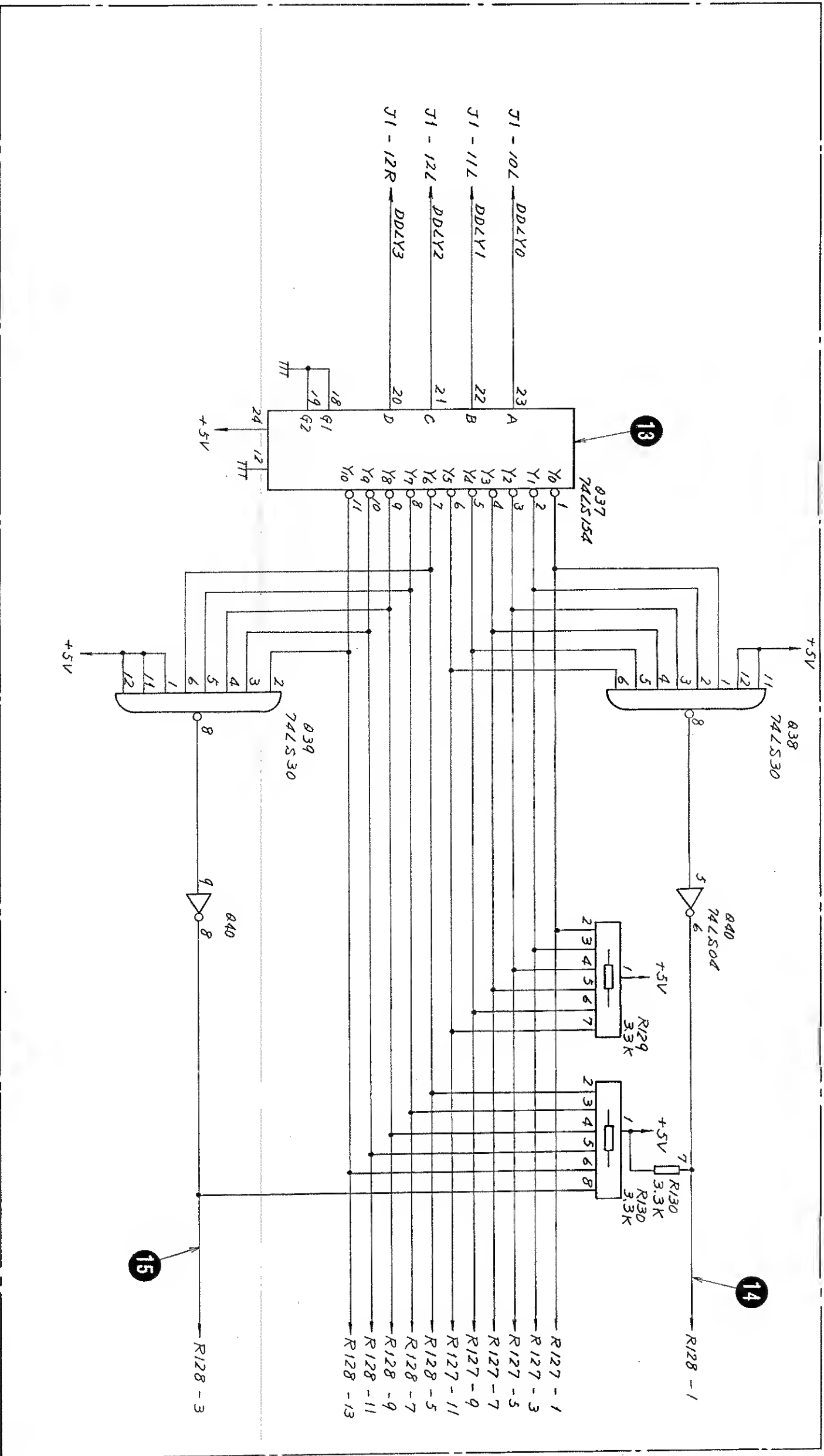
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3-151/3-152

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TITLE		DRAWING No.		

Z2 CLOCK DELAY Circuit Diagram

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No. 0023-1985.08

43W33619

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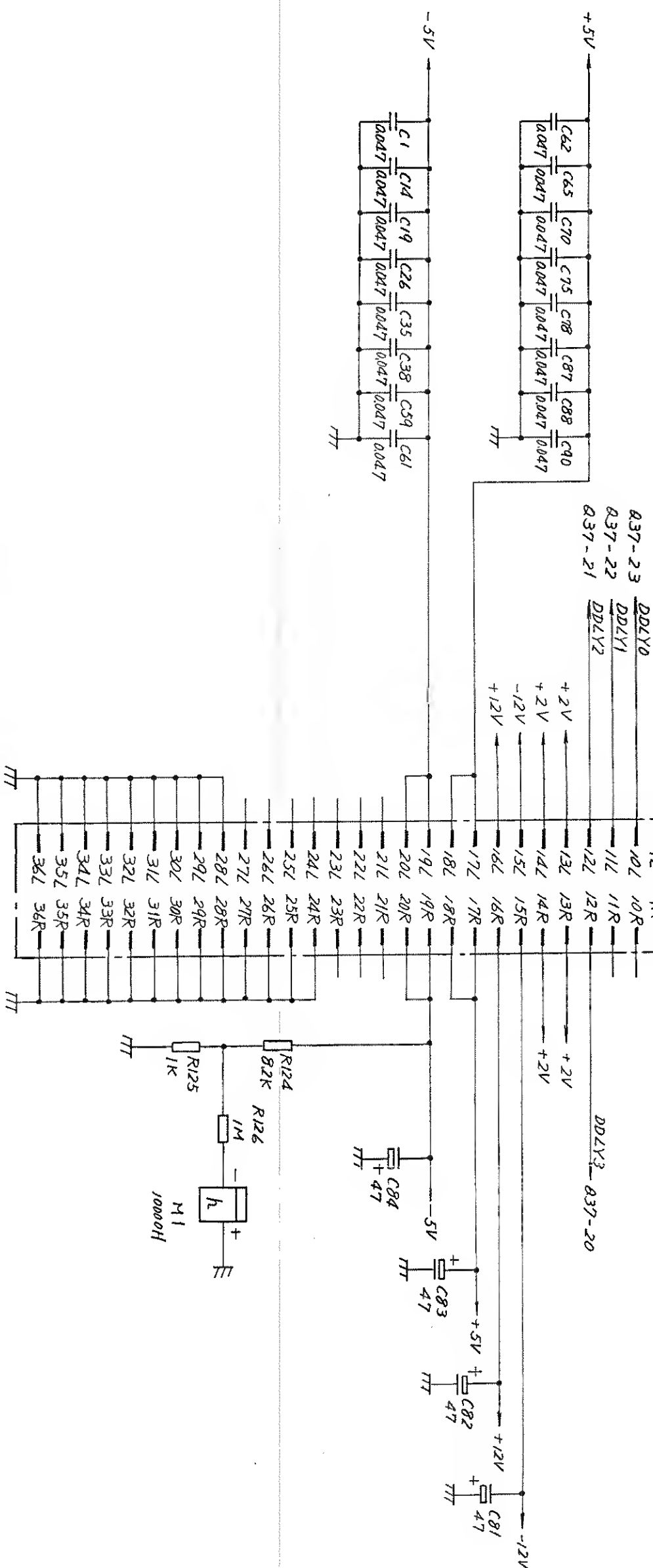
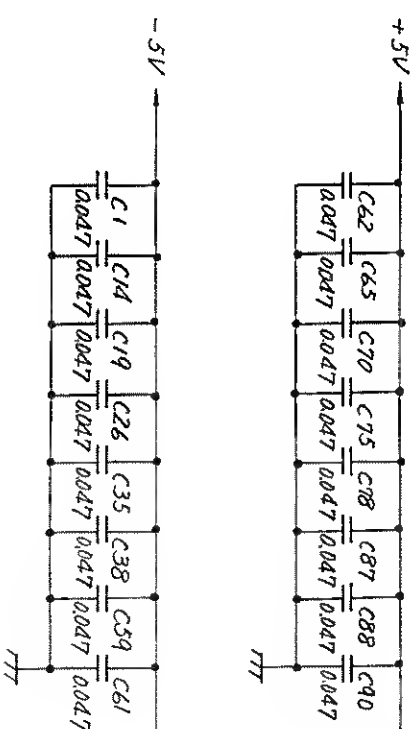
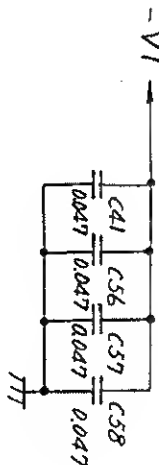


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3-153/3-154

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QTY/ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY	TRACED BY	SCALE		
APPROVED BY	DRAWN BY			

TITLE

Z2 CLOCK DELAY Circuit Diagram

DRAWING No.

43W33619

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14

No. 0023-1985-08

43W33619 5/5

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3-155/3-156

(1) Circuit description

Figure 3-49 shows the Z1 demultiplexer circuit block diagram.

A data input signal is input to the pulse shape through the threshold circuit.

Even when the input DATA has a dc offset, the

threshold circuit eliminates it if DATA THRESHOLD is

set on the panel. The pulse stretcher widens the pulse when the RZ format is used. After passing through the pulse stretcher, the DATA is branched into two

signals, input to the D-type flip-flops. The flip-

flops retime the DATA using two shaped output signals

(one is a polarity-reversed signal) from the delayed

clock, and then send them to the DATA1 and DATA2

output circuits. The DATA is output from the DATA1 or

DATA2 circuit (whichever selected by the relay).

The CLOCK signal is also output through an output

circuit.

The DATA1/DATA2 and CLOCK output signals from the

MH677A are sent to the DATA INPUT and CLOCK INPUT

terminals of the ME522A receiver.

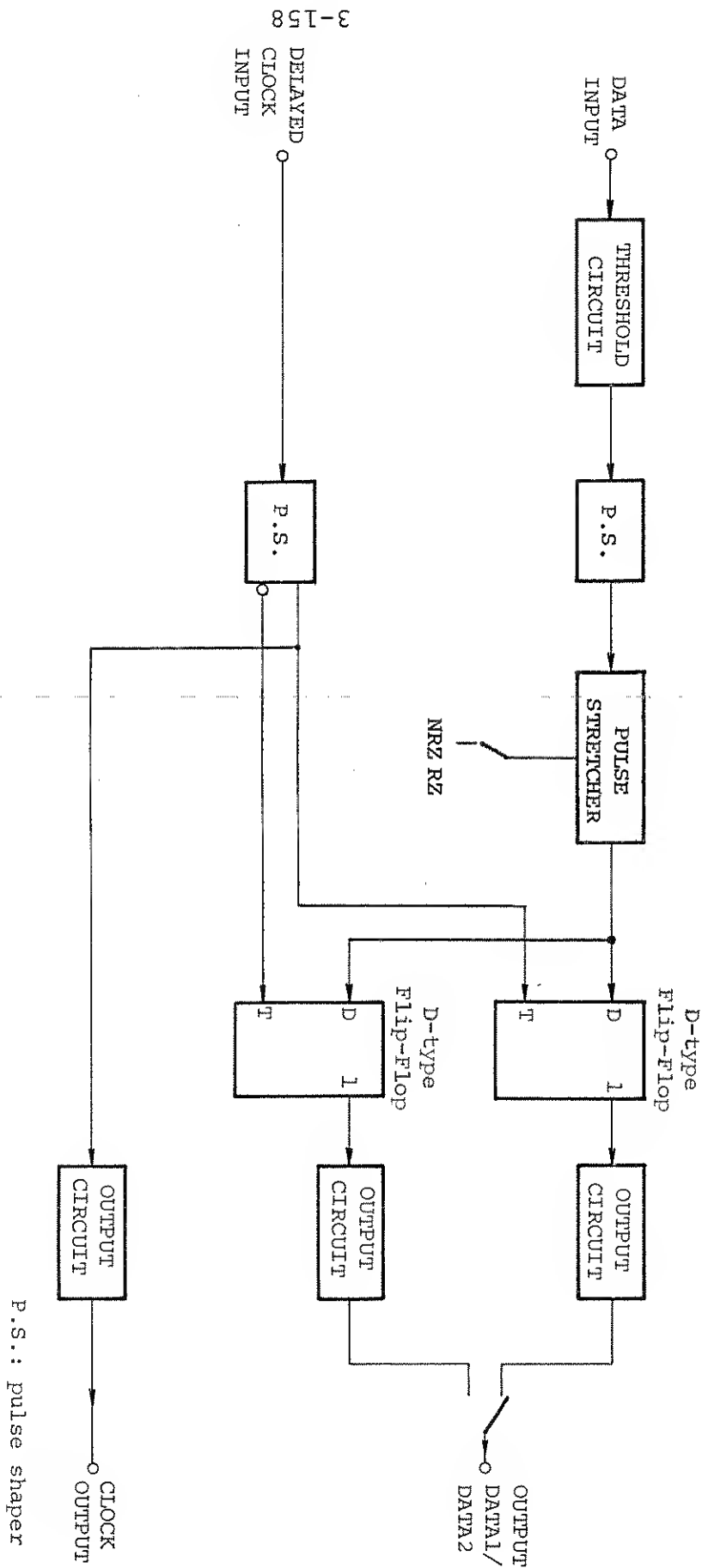


Fig. 3-49 MH677A Z1 DEMUX Block Diagram

(2) Troubleshooting

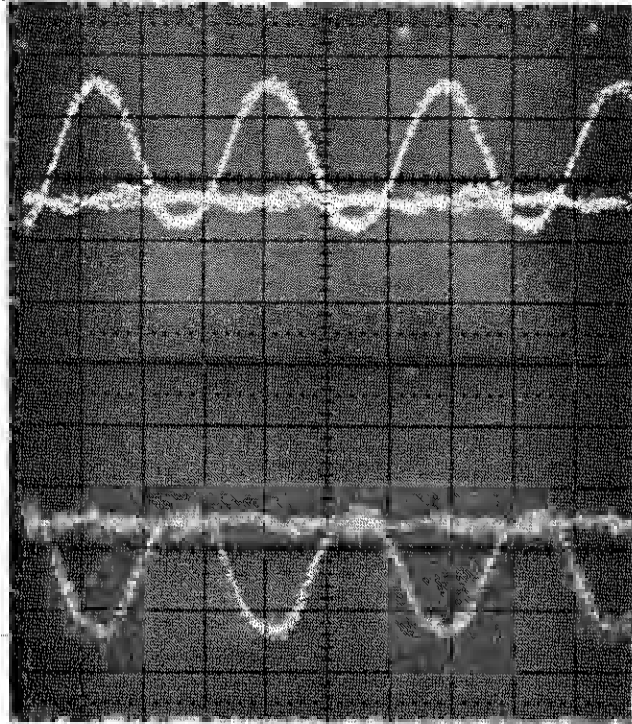
- (a) Remove the PC board Z1, and insert the extender board where the Z1 PC board was located. Then connect Z1 to the extender board. Set PC board Z1 to the same state as described in 3.6.4 (2) (a) and connect J3 of Z2 and J6 of Z1 with a cable. Disconnect the connectors from J2, J4, and J5 of PC board Z1, and connect J2 of PC board Z1 and the DATA OUTPUT terminal of the MH676A. (Use the SMA-P.RG58A/U:SMA-P 1 m coaxial cable as described in 3.6.4 (2) (a).)
- (b) Set the ME522A Transmitter, MH676A, and MH677A in the same way as described in 3.6.4 (2) (b).
- (c) Use the sampling oscilloscope with probe (MP671A) to check the waveforms at Z1 test points ① and ②.
- If the voltages are as shown in Figs. 3-50 and 3-51, go to the next step.
- If the voltages are abnormal, perform the operation described in item (d) and troubleshoot the circuits for J2, Q6, Q7, and the peripheral circuits. Check the waveforms by setting DATA FORMAT of the MH676A to NRZ or RZ.

3-160

in RZ Format

Fig. 3-51 Waveform at Z1 Test Point ① and ②

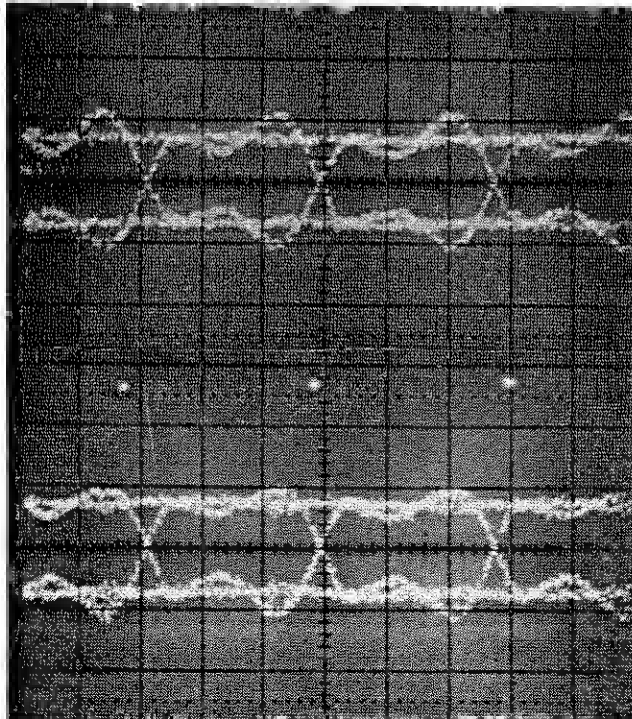
H: 0.5 ns/div
V: 0.5 V/div



in NRZ Format

Fig. 3-50 Waveform at Z1 Test Point ① and ②

H: 0.5 ns/div
V: 0.5 V/div



NRA or RZ.

The DATA FORMAT of the MH676A should be set to

Q14, and the peripheral circuits.

abnormal, troubleshoot the circuits from Q11 to 3-53, go to the next step. If the waveforms are If the waveforms are as shown in Figs. 3-52 and

4.

(e) Use the sampling oscilloscope with probe (MP671A) to check the waveforms at Z1 test point 3 and

The tolerance range is $\pm 10\%$

The above table lists the standard value.

MH676A setting	AMPLITUDE		OFFSET		THRESHOLD		MH677A			
	1 V	0 V	-0.5 V	+1.35 V	-3.5 V	+80 mV	1 V	+4 V	+3.5 V	+2.9 V
3 V	-1 V	-2.5 V	+0.6 V	-5.2 V	0.45 V					

13, 14, and 15

Table 3-19 DC Voltages at Z1 Test Points

MH676A and MH677A as described in 3.6.4 (2) (b).

After checking, go to step (e) after setting the

MH677A (as listed in Table 3-19).

MH676A and the DATA THRESHOLD setting of the

OUTPUT AMPLITUDE and OFFSET settings of the

Also measure the voltages when changing the DATA

circuits.

circuits for Q19 and Q18, and the peripheral

If the voltages are abnormal, troubleshoot the

Table 3-19 lists the normal voltages.

Z1 test points 13 to 15.

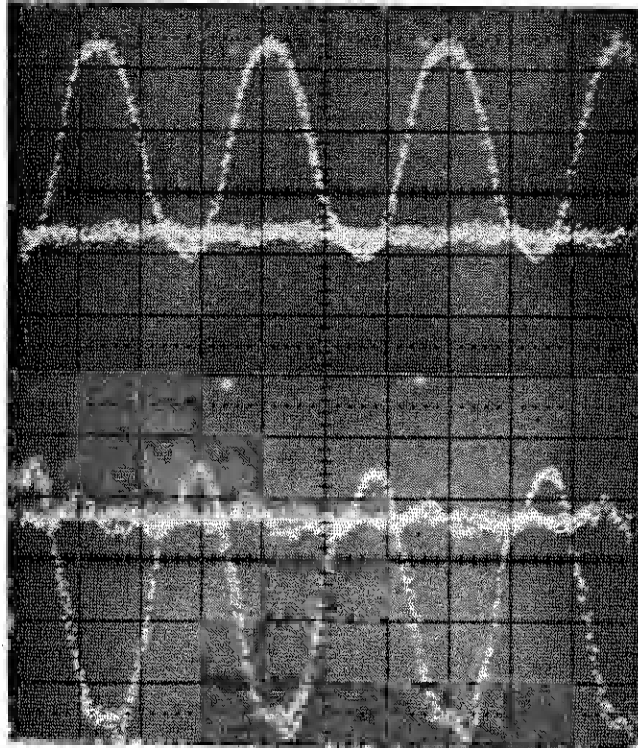
(d) Use a dc voltmeter to measure the dc voltages at

3-162

in RZ Format

Fig. 3-53 Waveform at Z1 Test Point ③ and ④

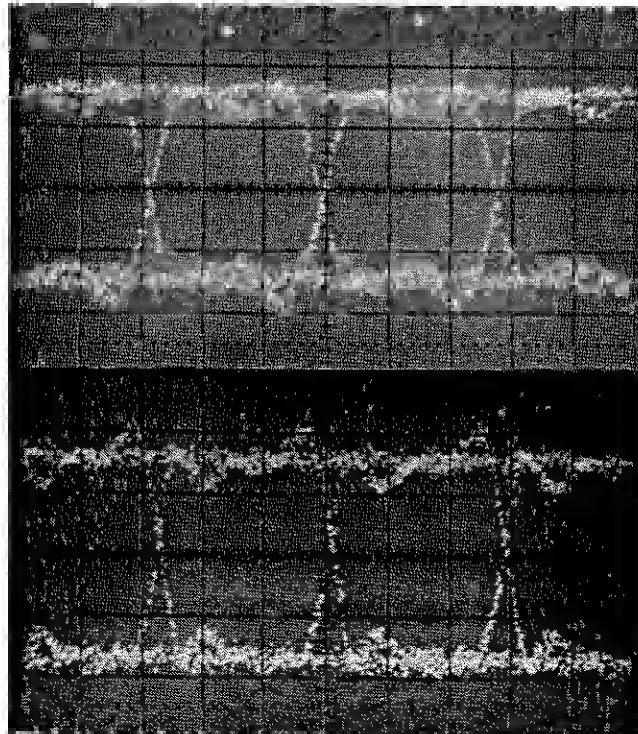
H: 0.5 ns/div
V: 0.5 V/div



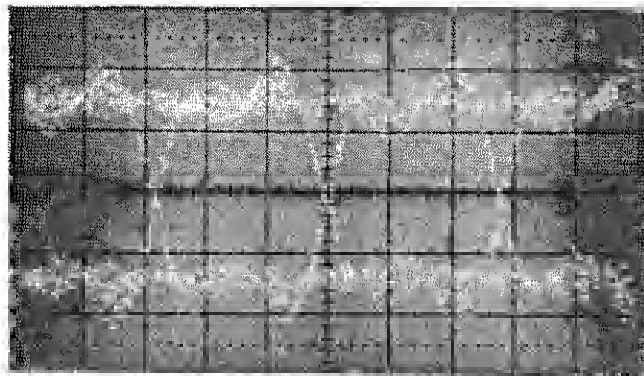
in NRZ Format

Fig. 3-52 Waveform at Z1 Test Point ③ and ④

H: 0.5 ns/div
V: 0.5 V/div

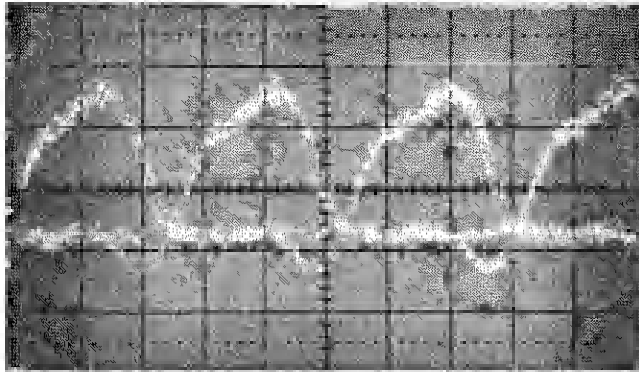


- (f) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑤. If the waveform is as shown in Figs. 3-54 or 3-55, go to the next step.
- If the waveform is abnormal, troubleshoot the circuits for Q15 to Q17, K1, and K2, and the peripheral circuits.
- To check ⑤, set the MH676A and MH677A FORMATS to NRZ or RZ.



H: 0.5 ns/div
V: 0.5 V/div

Fig. 3-54 Waveform at Z1 Test Point ⑤ in NRZ Format



H: 0.5 ns/div
V: 0.5 V/div

Fig. 3-55 Waveform at Z1 Test Point ⑤ in RZ Format

(g) Use the sampling oscilloscope with probe (MP671A) to check the waveforms and phases at Z1 test points ⑥ and ⑦.

Figure 3-56 and 3-57 shows the standard waveforms. To check ⑥ and ⑦, set the MH676A and MH677A formats to NRZ or RZ. If the waveforms are abnormal, troubleshoot the circuits for Q32, Q34, Q36, Q43, and Q44, and the peripheral circuits.

PHASE ADJUST should be set to 0.

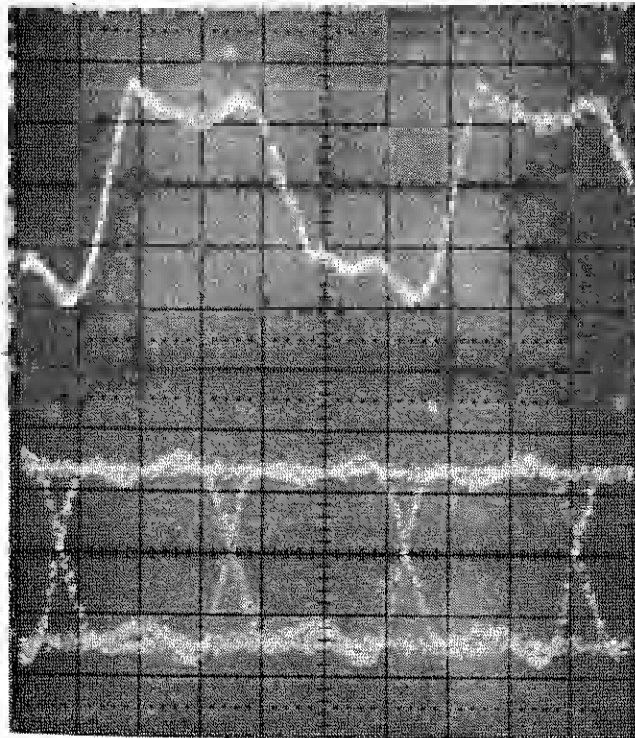


Fig. 3-56 Waveform, at Z1 Test Point ⑥ and ⑦ in NRZ Format

PHASE ADJUST should be set to 0.

peripheral circuits.

If the waveforms are abnormal, troubleshoot the circuits for Q33, Q34, and Q41, and the

to the next step to check ⑧ and ⑨ .
If they are as shown in Figs. 3-58 and 3-59, set the MH676A and MH677A formats to NRZ or RZ and go

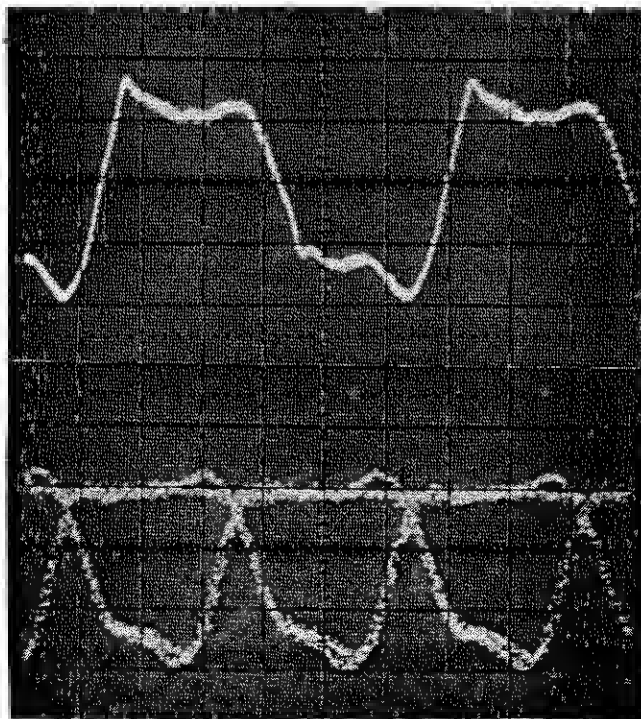
points ⑧ and ⑨ .

(h) Use the sampling oscilloscope with probe (MP671A) to check the waveforms and phases at Z1 test

in RZ Format

Fig. 3-57 Waveform at Z1 Test Point ⑥ and ⑦

H: 0.5 ns/div
V: 0.5 V/div



⑦

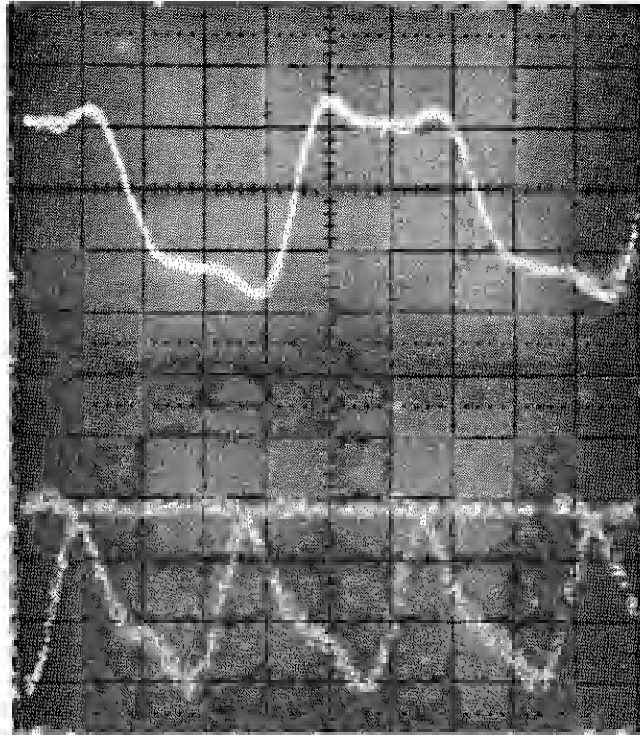
⑥

3-166

in RZ Format

Fig. 3-59 Waveform at Z1 Test Point ⑧ and ⑨

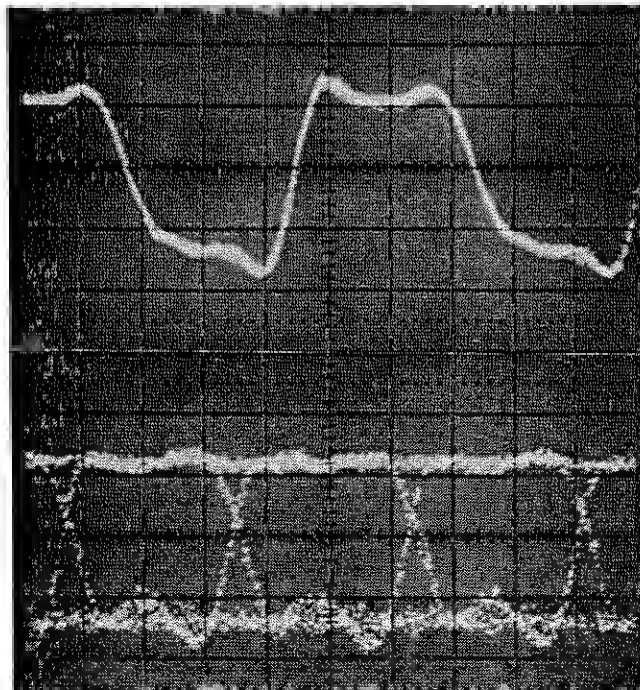
H: 0.5 ns/div
V: 0.5 V/div



in NRZ Format

Fig. 3-58 Waveform at Z1 Test Point ⑧ and ⑨

H: 0.5 ns/div
V: 0.5 V/div



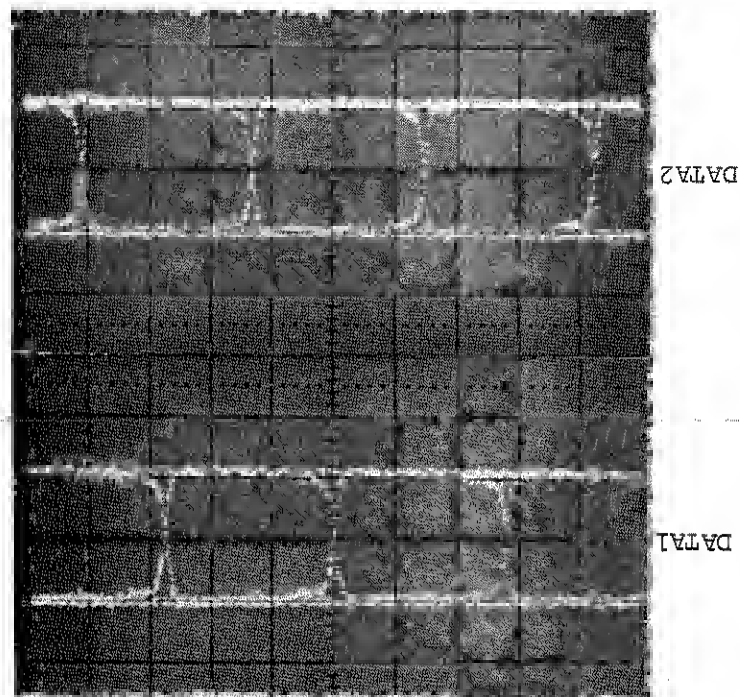
(1) Use the sampling oscilloscope to check the waveform at Z1 test point ⑩ .

Figure 3-60 shows the standard waveform.

Make sure that the waveform does not change even when the MH676A and MH677A formats are set to NRZ or RZ.

Set OUTPUT to DATA1 and then DATA2 to check the waveform at ⑩ .

If the waveforms are abnormal, troubleshoot the circuits for Q31, Q28, Q30, and K3, and the peripheral circuits.



H: 1 ns/div
V: 0.5 V/div

Fig. 3-60 Waveform at Z1 Test Point ⑩

- (j) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑩ . If the waveform is as shown in Fig. 3-61, go to the next step.
- If the waveform is abnormal, troubleshoot the circuits for J6 and Q42, and the peripheral circuits.
- (k) Use the sampling oscilloscope to check the waveform at Z1 test point ⑪ . Figure 3-62 shows the normal waveform.
- If the waveform is abnormal, troubleshoot the circuits for Q43, Q45, and Q47, and the peripheral circuits.

Fig. 3-61 Waveform at Z1 Test Point ⑩

H: 0.5 ns/div
V: 0.5 V/div

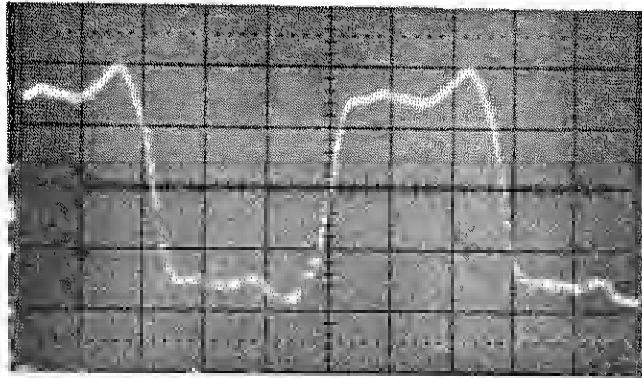
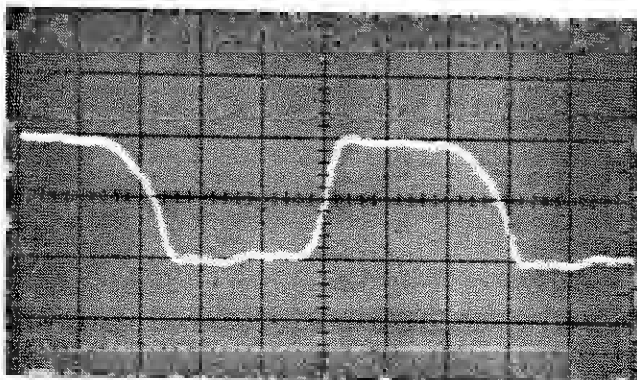


Fig. 3-62 Waveform at Z1 Test Point ⑫

H: 0.5 ns/div
V: 0.5 V/div



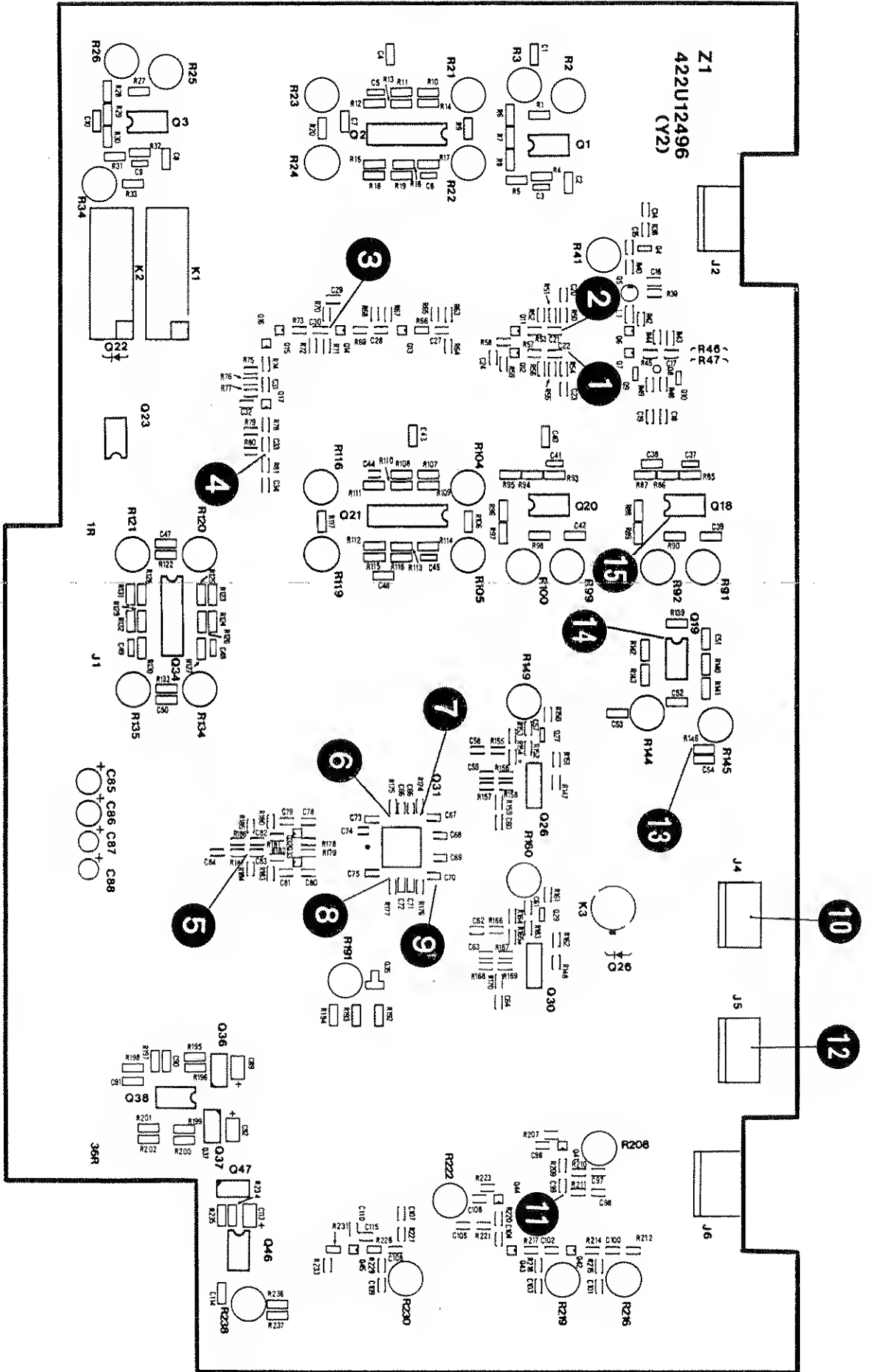
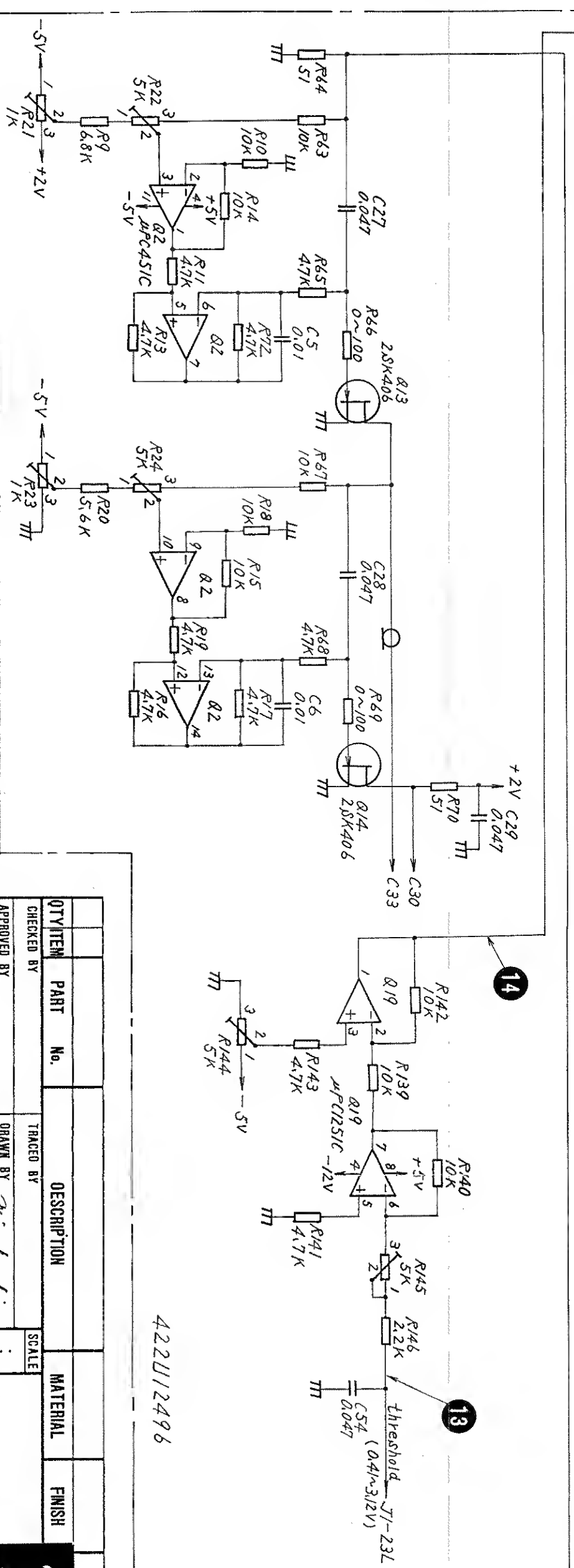


Fig. 3-63 Parts Layout of MH677A Z1 Demux PC Board



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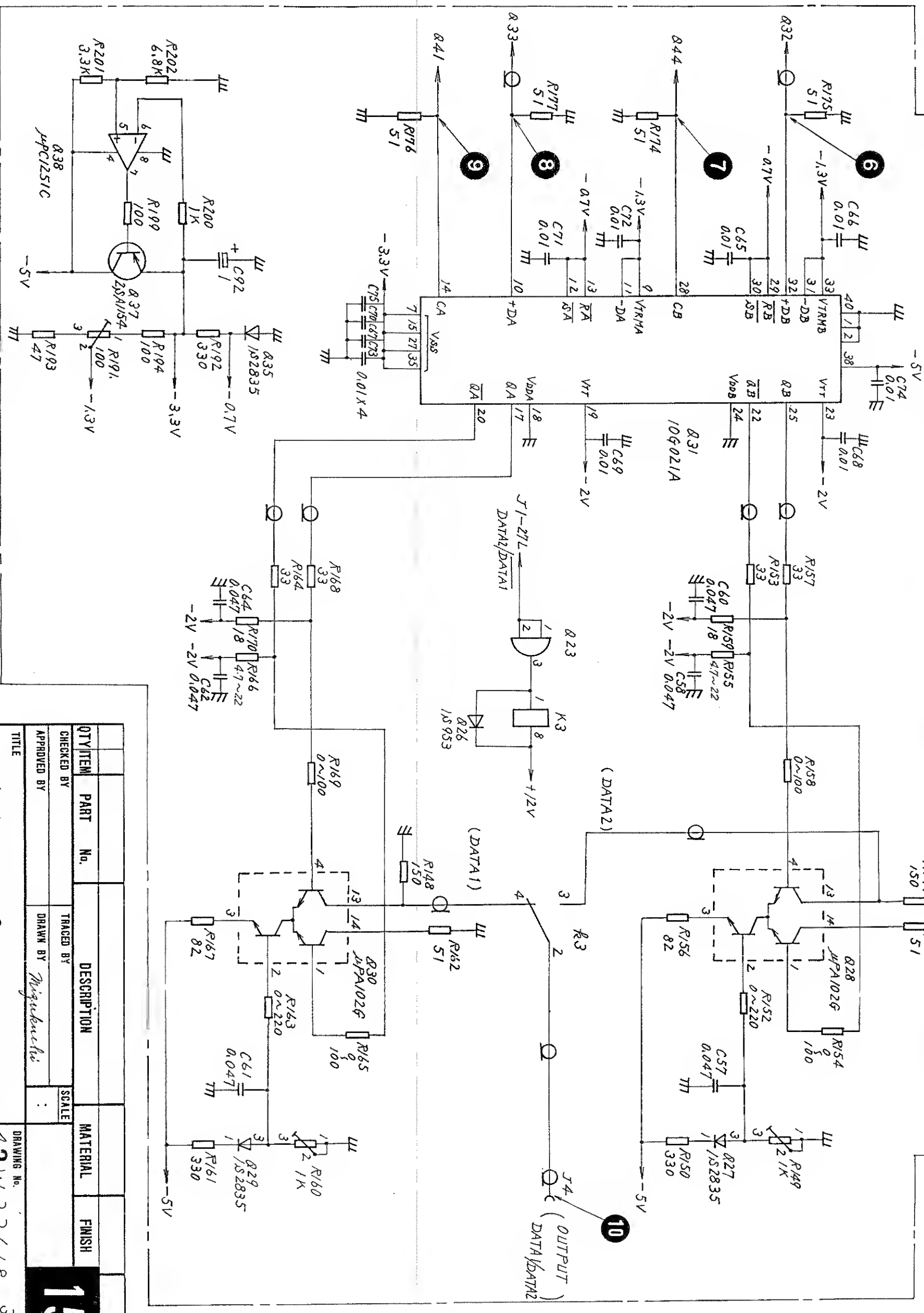
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15

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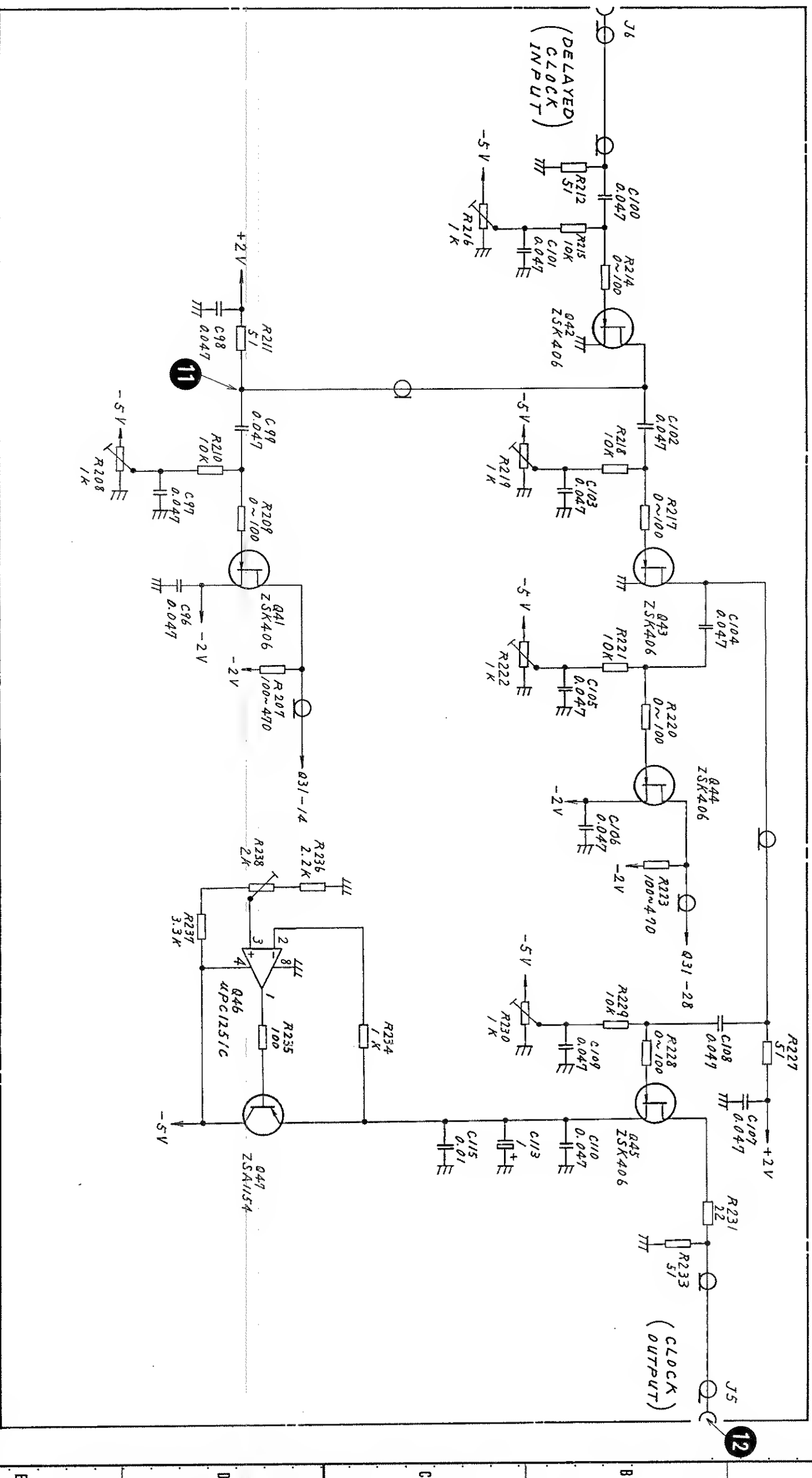
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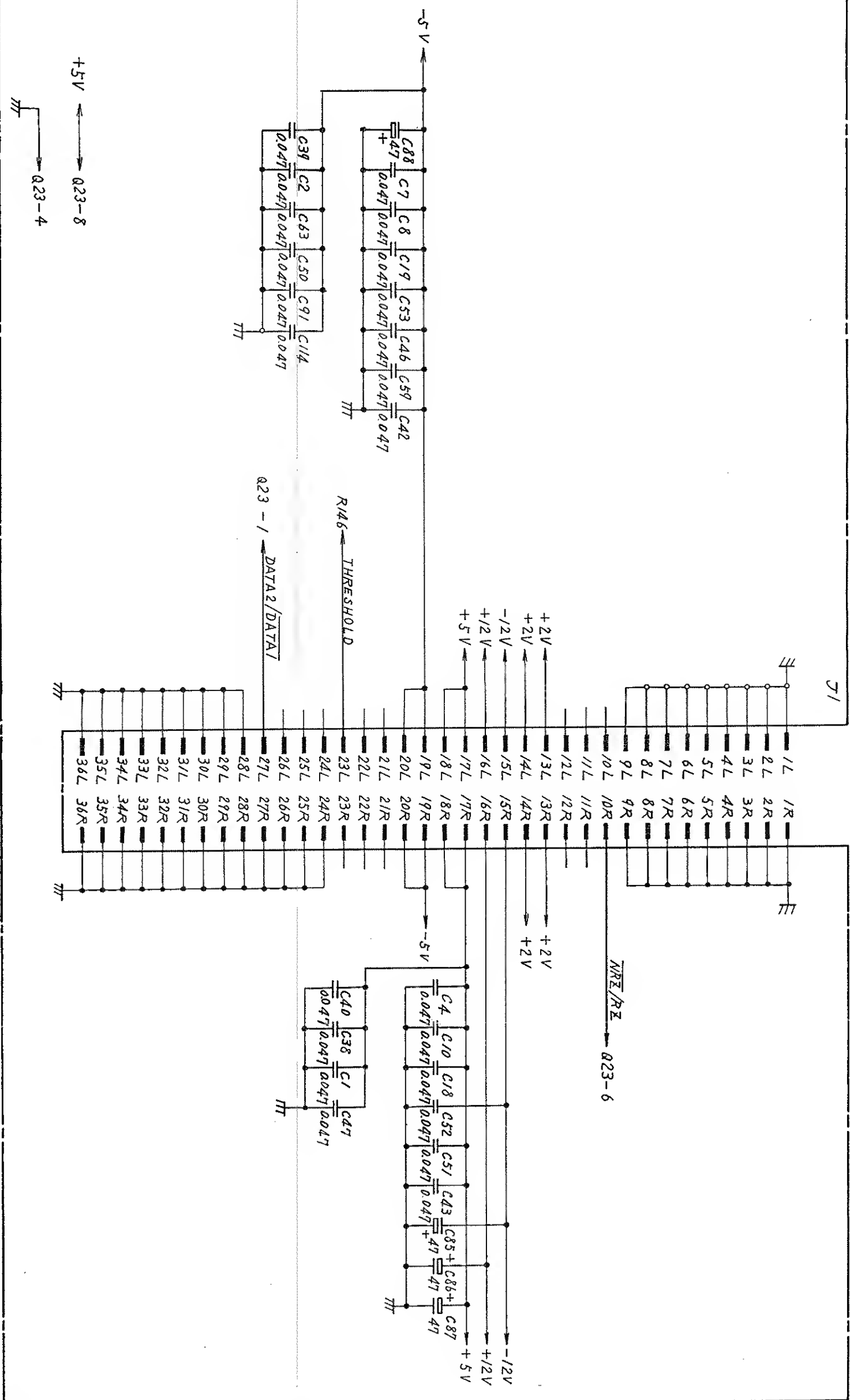
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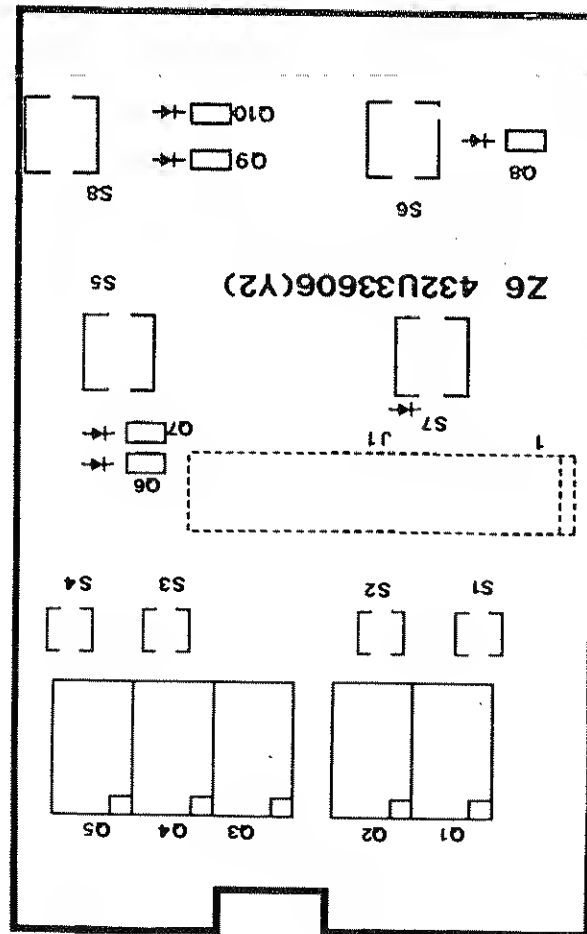


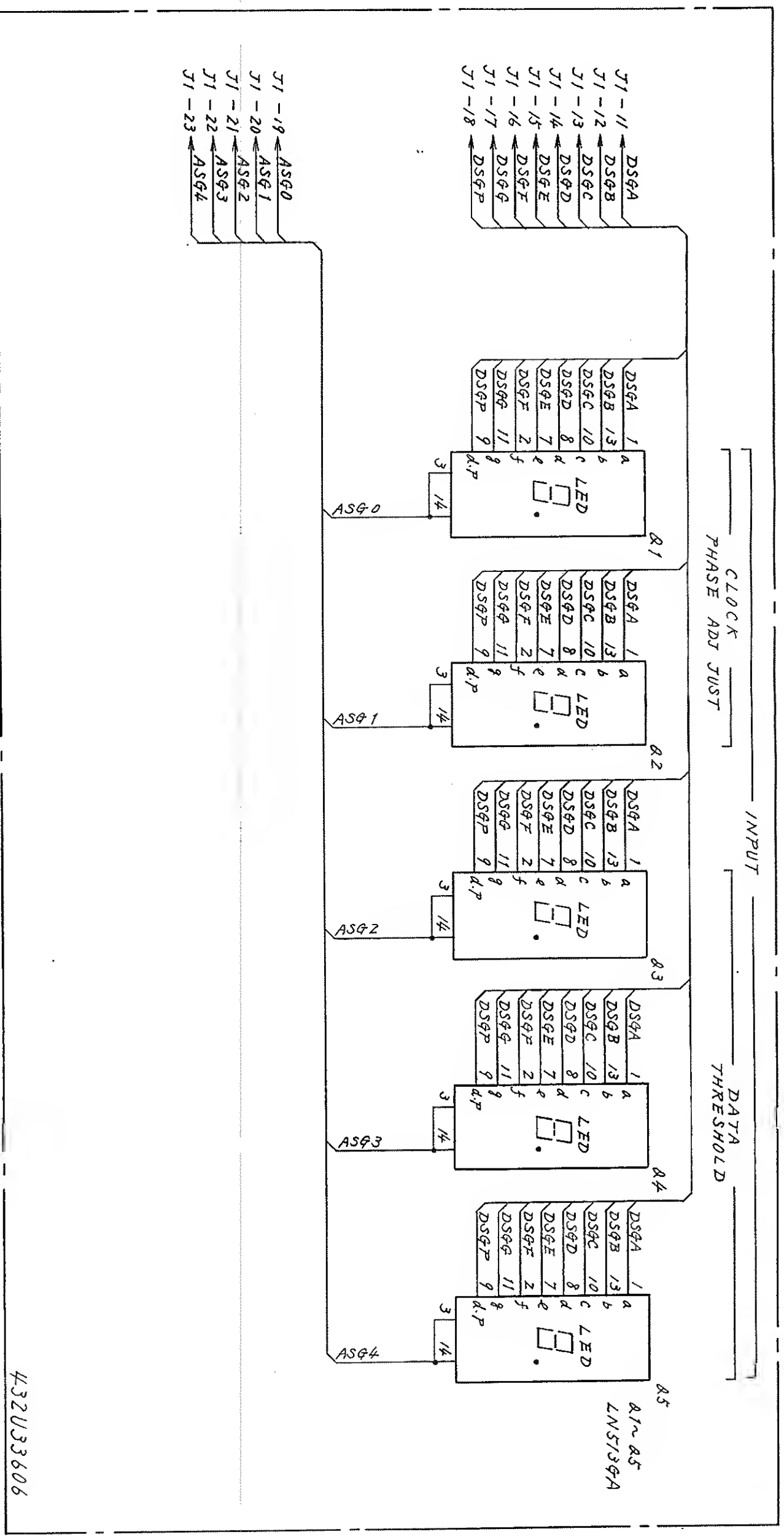
DEP

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3.6.6 MH677A Z6 Display PC board **16** , Z13 GP-IB
PC board **17** , and Z14 RS-232C PC board **18**

Fig. 3-64 Parts Layout of MH677A Z6 Display
PC Board 16



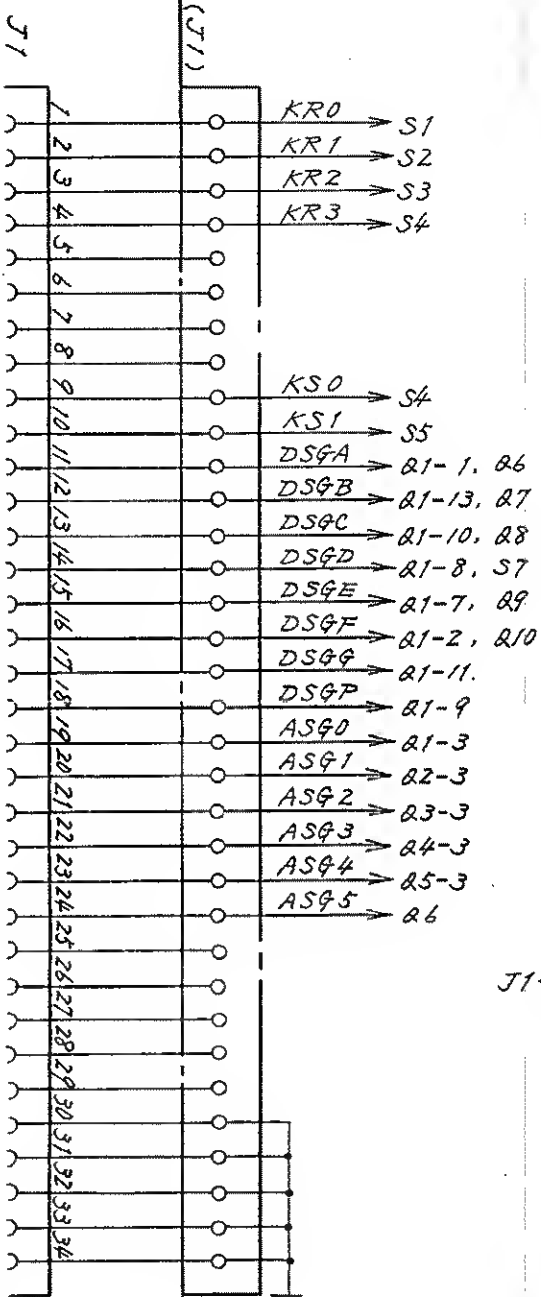
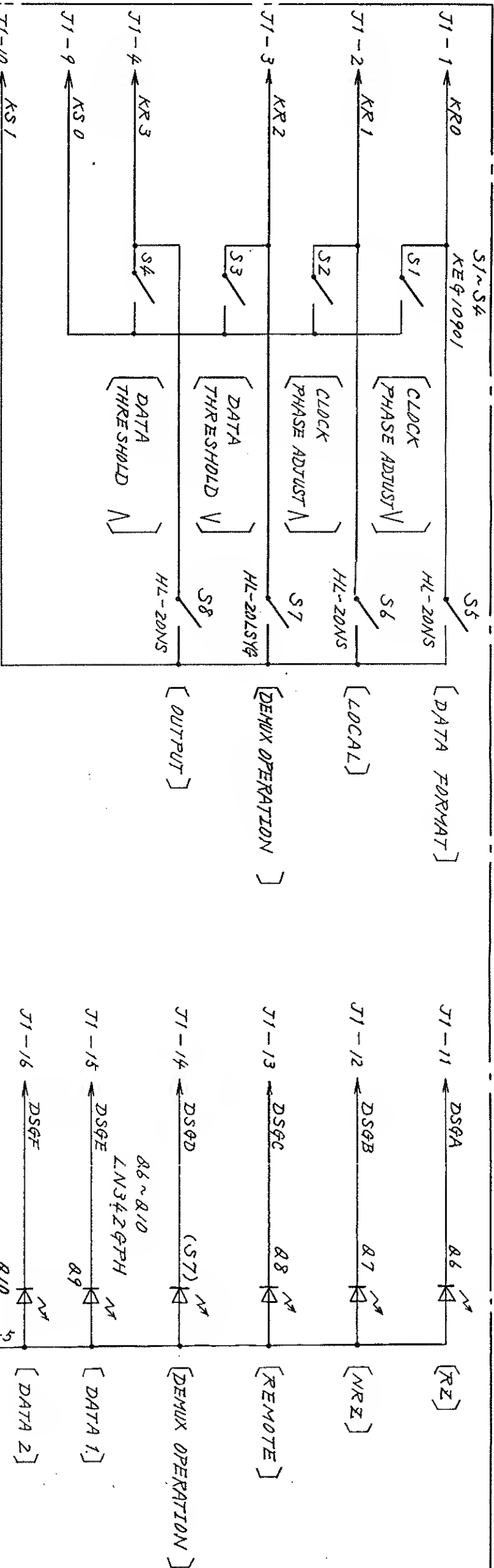


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16						

APPLICATION

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DEP

QTY	ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY				TRACED BY		
APPROVED BY				DRAWN BY	Miyakuchi	
TITLE	Z6 DISPLAY Circuit Diagram.					
DRAWING No.	43W33621 2/2					

16

No. DD23-1985, DB



ANRITSU CORP.

3-185

43W33621 2/2

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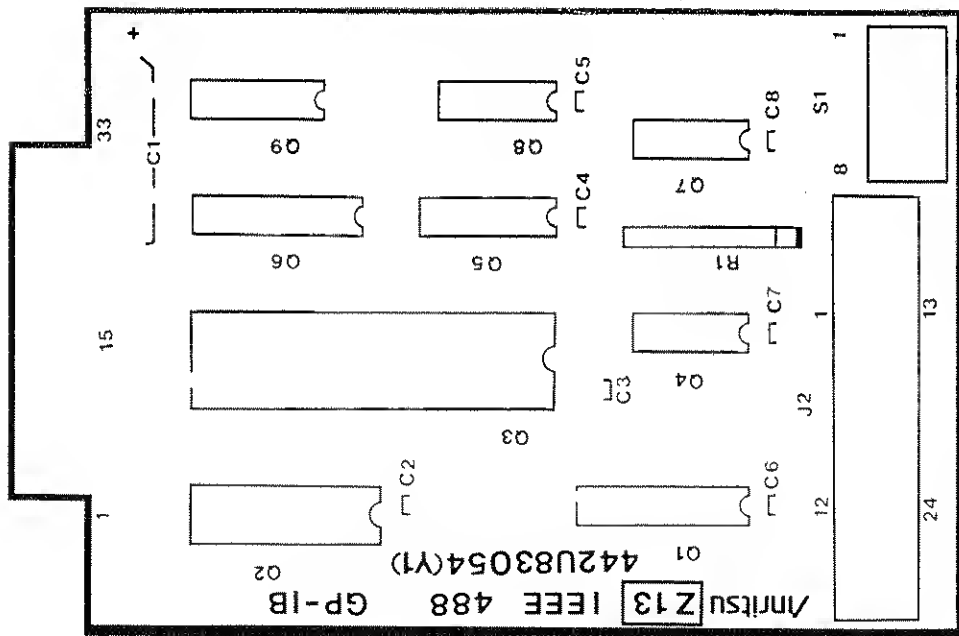
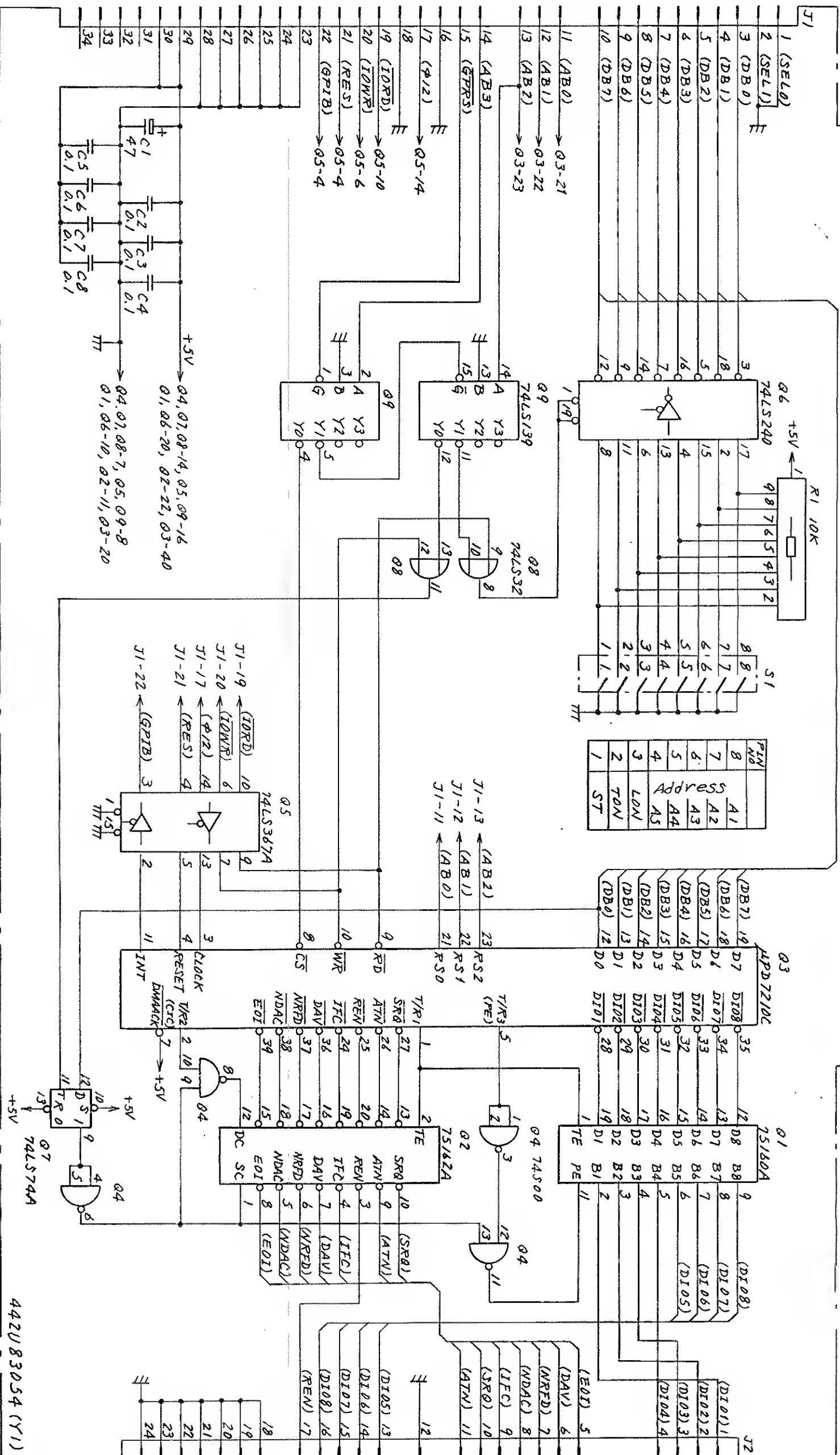


Fig. 3-65 Parts Layout of Z13 GP-1B Board

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APPLICATION

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PARTS LIST 44W83046

QTY/ITEM	PART NO.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY		TRACED BY		
APPROVED BY		DRAWN BY		

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DEP

TITLE

Z13 GP-1B
Circuit Diagram

DRAWING No.

43W33432

No. 0023-1985-08



ANRITSU CORP.

3-187

43W33432

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3

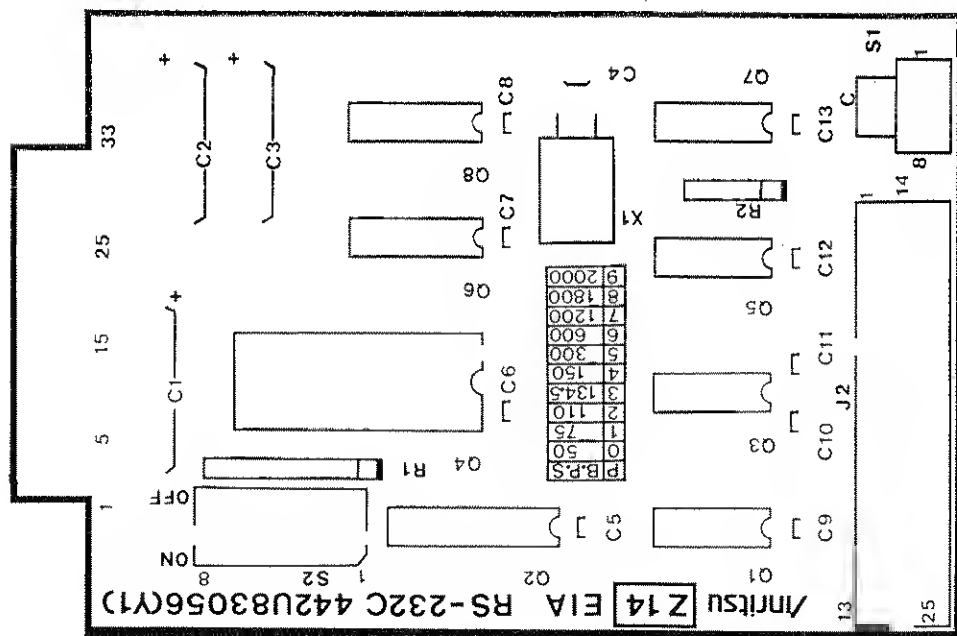
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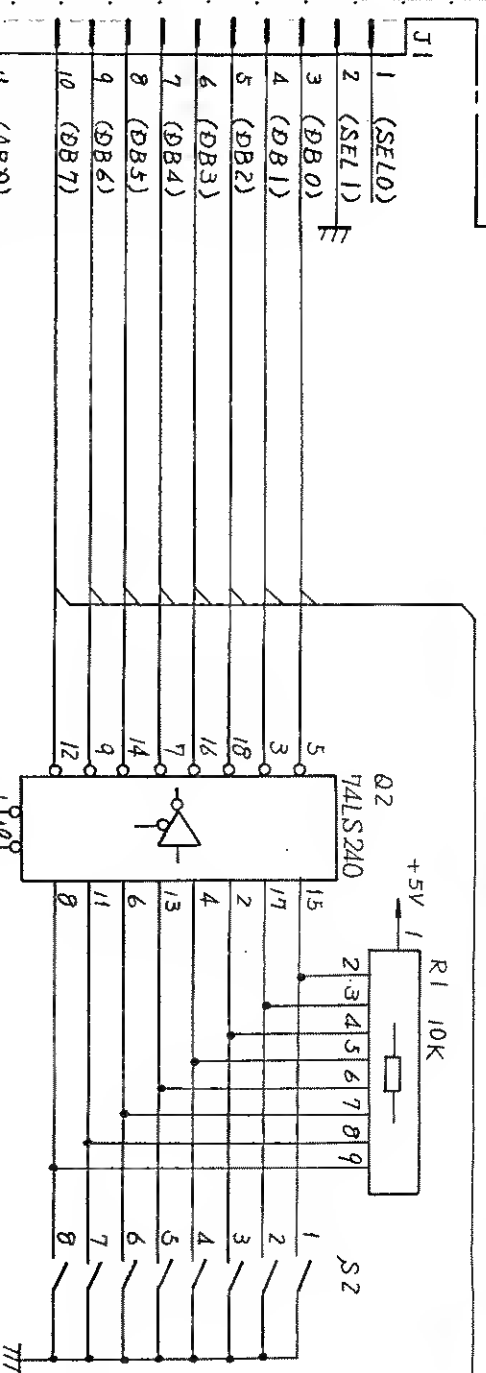


Amitsu Z14 EIA RS-232C 442U83056(Y1)

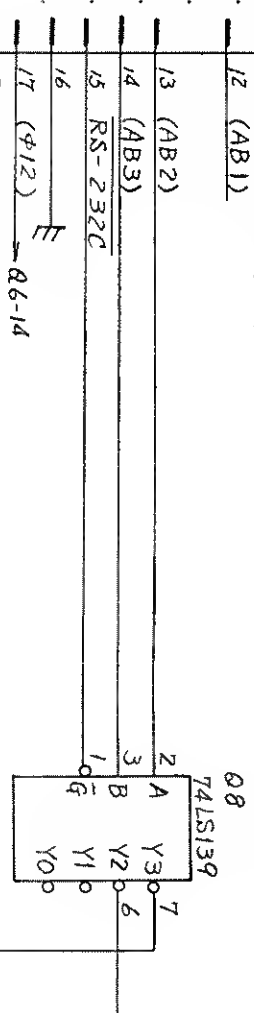
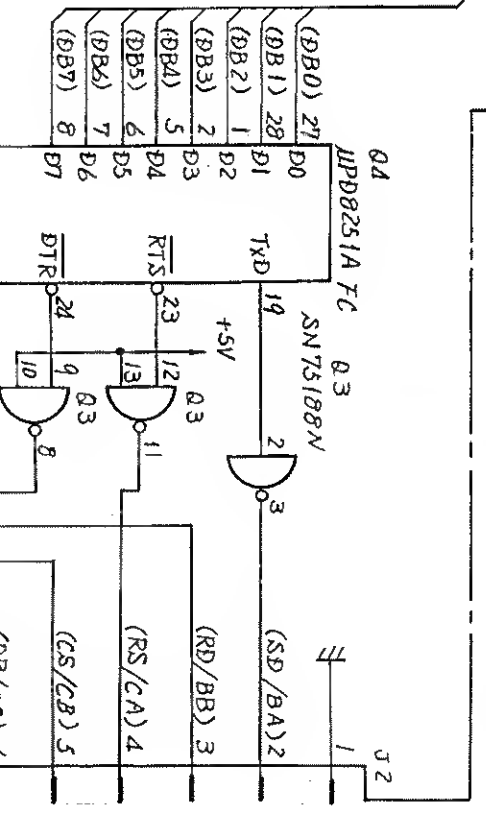
Fig. 3-66 Parts Layout of Z14 RS-232 PC Board

APPLICATION

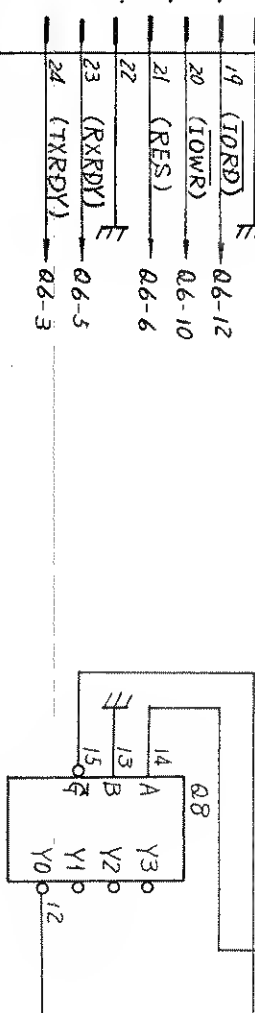
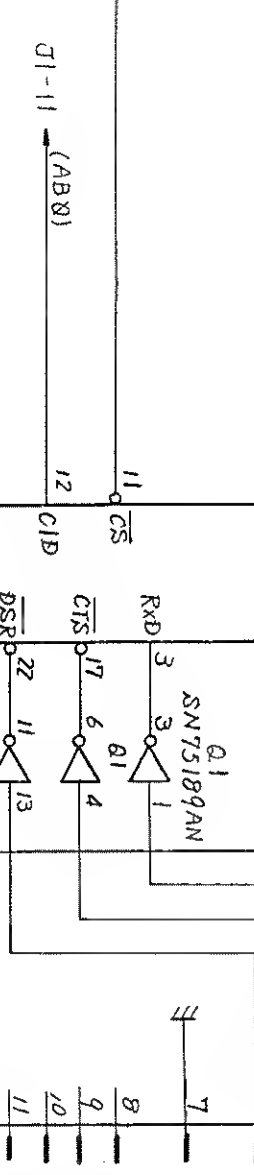
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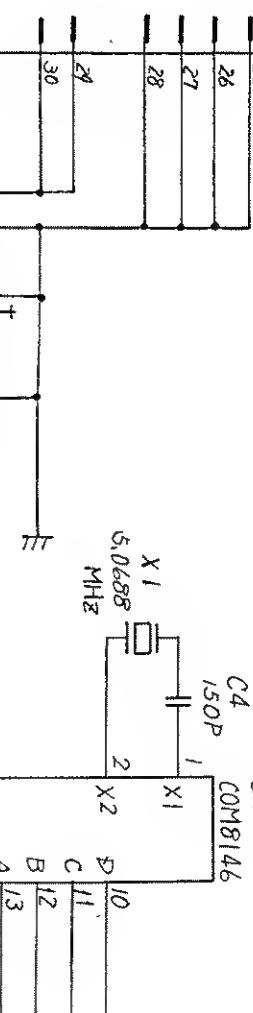
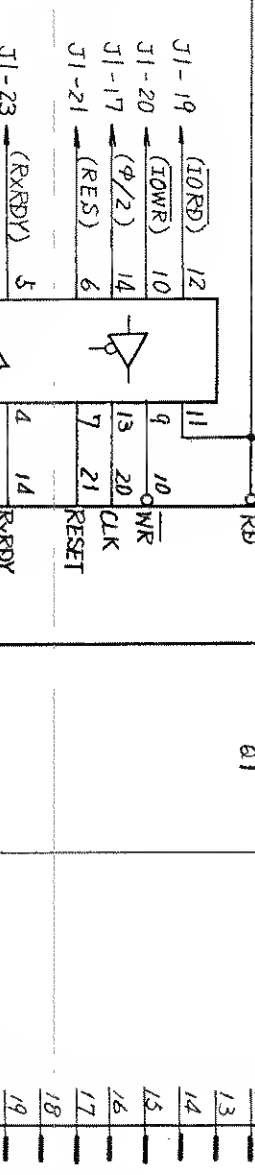
S2	Character length	Parity	Even	Stop	Bit	Not-Used
1	ON	OFF	ON	ON	ON	ON
2	OFF	ON	OFF	ON	ON	ON
3	OFF	OFF	ON	ON	ON	ON
4	ON	ON	OFF	ON	ON	ON
5	ON	ON	ON	ON	ON	ON
6	ON	ON	ON	ON	ON	ON
7	ON	ON	ON	ON	ON	ON
8	ON	ON	ON	ON	ON	ON



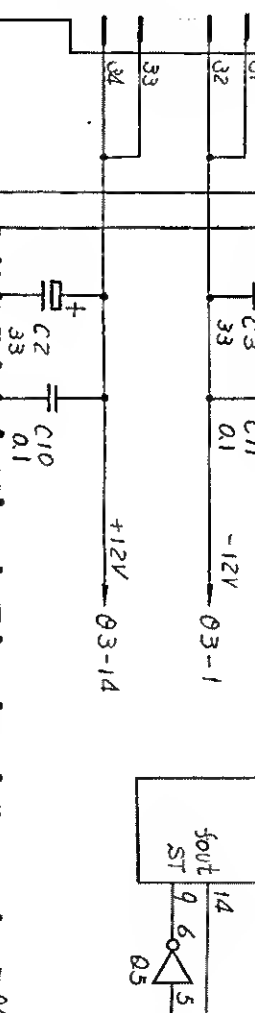
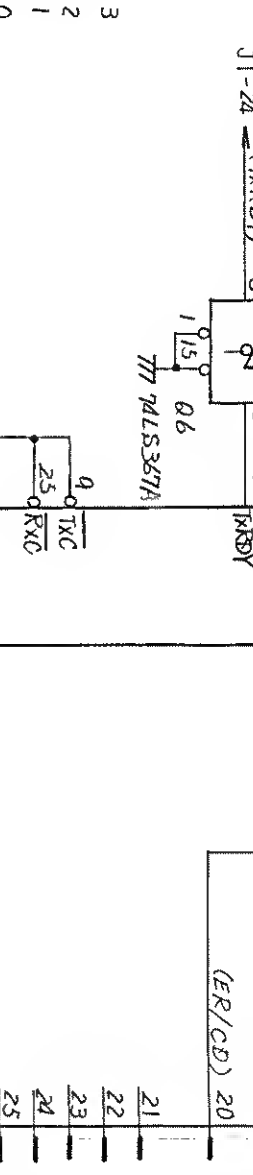
S2	Character length	Parity	Even	Stop	Bit	Not-Used
1	ON	OFF	ON	ON	ON	ON
2	OFF	ON	OFF	ON	ON	ON
3	OFF	OFF	ON	ON	ON	ON
4	ON	ON	OFF	ON	ON	ON
5	ON	ON	ON	ON	ON	ON
6	ON	ON	ON	ON	ON	ON
7	ON	ON	ON	ON	ON	ON
8	ON	ON	ON	ON	ON	ON



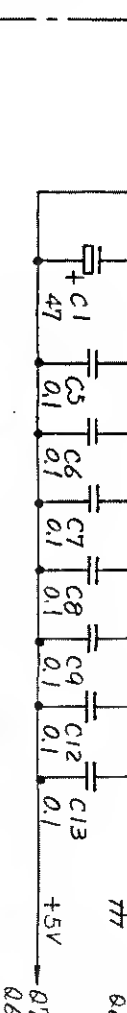
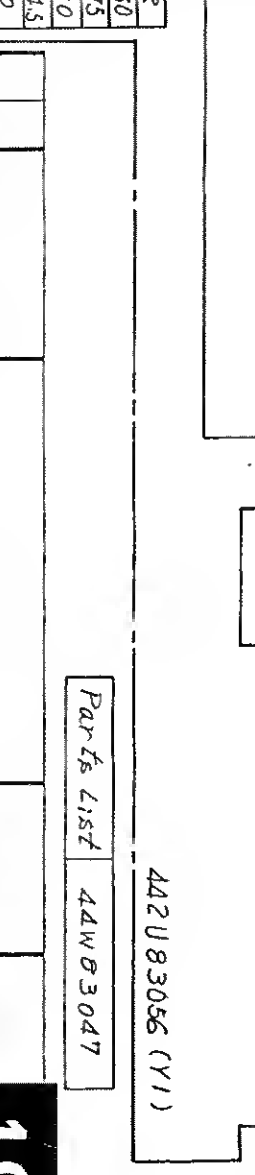
S2	Character length	Parity	Even	Stop	Bit	Not-Used
1	ON	OFF	ON	ON	ON	ON
2	OFF	ON	OFF	ON	ON	ON
3	OFF	OFF	ON	ON	ON	ON
4	ON	ON	OFF	ON	ON	ON
5	ON	ON	ON	ON	ON	ON
6	ON	ON	ON	ON	ON	ON
7	ON	ON	ON	ON	ON	ON
8	ON	ON	ON	ON	ON	ON



S2	Character length	Parity	Even	Stop	Bit	Not-Used
1	ON	OFF	ON	ON	ON	ON
2	OFF	ON	OFF	ON	ON	ON
3	OFF	OFF	ON	ON	ON	ON
4	ON	ON	OFF	ON	ON	ON
5	ON	ON	ON	ON	ON	ON
6	ON	ON	ON	ON	ON	ON
7	ON	ON	ON	ON	ON	ON
8	ON	ON	ON	ON	ON	ON



S2	Character length	Parity	Even	Stop	Bit	Not-Used
1	ON	OFF	ON	ON	ON	ON
2	OFF	ON	OFF	ON	ON	ON
3	OFF	OFF	ON	ON	ON	ON
4	ON	ON	OFF	ON	ON	ON
5	ON	ON	ON	ON	ON	ON
6	ON	ON	ON	ON	ON	ON
7	ON	ON	ON	ON	ON	ON
8	ON	ON	ON	ON	ON	ON



S2	Character length	Parity	Even	Stop	Bit	Not-Used
1	ON	OFF	ON	ON	ON	ON
2	OFF	ON	OFF	ON	ON	ON
3	OFF	OFF	ON	ON	ON	ON
4	ON	ON	OFF	ON	ON	ON
5	ON	ON	ON	ON	ON	ON
6	ON	ON	ON	ON	ON	ON
7	ON	ON	ON	ON	ON	ON
8	ON	ON	ON	ON	ON	ON



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QTY/ITEM	PART	No.	DESCRIPTION	MATERIAL	FINISH
CHECKED BY					
APPROVED BY					
DRAWN BY					

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SECTION 4

REPLACEABLE PARTS

4.1 Introduction

This section contains information about ordering replacement parts of components. The following table shows circuit references (hereinafter: CKT REF) and abbreviations used for items in the Parts Lists. The quantity of each item in the Parts List is "one" unless a quantitative description is given in the "NOTE" column.

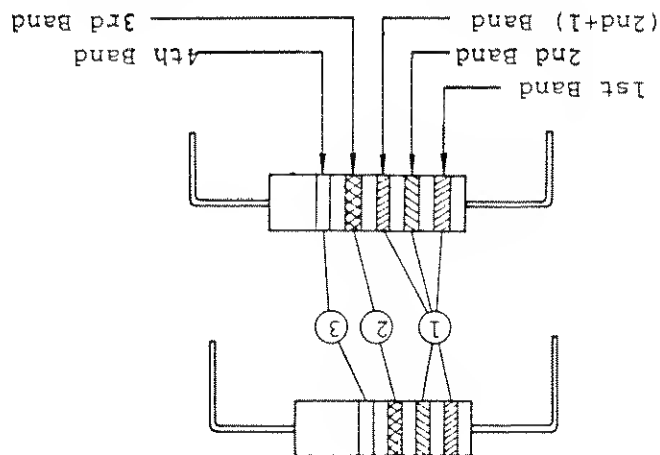
(1) Circuit reference

AT: Attenuator	K: Relay	Q: Transistor, diode, IC, rectifier	V: Neon lamp, vacuum tube
C: Capacitor	L: Coil, microinductor	R: Resistor	X: Crystal OSC
F: Fuse	M: Meter, timer	S: Switch	Z: Unit
J: Jack, plug, connector	P: Lamp	T: Transformer	

(2) Abbreviations

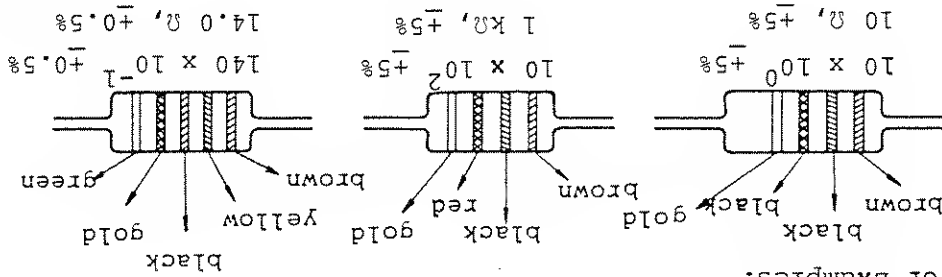
A: amperes	Multi: multiplying	N-ch: N-channel	
Att, R var: variable attenuator using film elements	non-lin: non-linear taper	Non-pol: non polarity	
BL: boundary layer	NPN: negative-positive-negative	Q: ohms	
Cer: ceramic	CF: carbon film	Comp: composition	
CRT: cathode-ray tube	Plast: plastic film	PWTR: potentiometer	
DIP: dual in-line package	PNP: positive-negative-positive	P-P: peak-to-peak value	
Elect: electrolytic aluminum	RFC: RF choke	R-lamp: resistor lamp	
FET: field-effect transistor	rms: effective value (root-mean-square)	SBD: Schotky barrier diode	
H: henry	SCR: silicon-controlled rectifier	SI: silicon	
Hz: hertz	SRD: step-recovery diode	Tant: tantalum	
J-FET: junction FET	TM: time-lag	Tr: transistor	
K: kilo ($\times 10^3$)	LED: light-emitting diode	M: mega ($\times 10^6$)	
m: mill ($\times 10^{-3}$)	MF: metallized film	Var: variable	
MOS-FET: metal-oxide semiconductor FET	MW: wire-wound	XTAL: crystal	
M paper: metallized paper			
M plast: metallized plastic film			

4.2 Reading Capacitors/Resistors 4.2.1 Capacitor Identification



COLOR	Figure		Multiplier	Tolerance
	1st	2nd		
Black	0	0	$\times 10^0$	-
Brown	1	1	$\times 10^1$	-
Red	2	2	$\times 10^2$	-
Orange	3	3	$\times 10^3$	-
Yellow	4	4	$\times 10^4$	-
Green	5	5	$\times 10^5$	$\pm 0.5\%$
Blue	6	6	$\times 10^6$	-
Purple	7	7	$\times 10^7$	-
Grey	8	8	$\times 10^8$	-
White	9	9	$\times 10^9$	-
Gold	-	-	$\times 10^{-1}$	$\pm 5\%$
Silver	-	-	$\times 10^{-2}$	$\pm 10\%$
----	-	-	-	$\pm 20\%$

For Examples:




Value in Picofarads (pF)

CAPACITANCE

MULTIPLIER

Number of zeros following value



EXAMPLES:

103 = 10,000 pF = 10^{-8} F or 0.01 μ F

302 = 3,000 pF = 3×10^{-9} F or 0.003 μ F

676 = 67,000,000 pF = 67×10^{-6} F or 67 μ F

(a) Ceramic and polyester capacitors

Indication	Capacity
0.5	0.5 pF
1	1 pF
10	10 pF
101	100 pF
102	1000 pF
103	0.01 μ F
104	0.1 μ F

Example:

Ceramic Capacitor

1000 pF $\frac{102}{D}$

4700 pF $\frac{472M}{D}$

0.5 pF $\frac{0.5C}{\square}$

10 pF $\frac{10D}{\square}$

100 pF $\frac{101J}{\square}$

Capacity values are always underlined.

Polyester Capacitor

1000 pF $\frac{102K}{50F1}$

0.01 μ F $\frac{103K}{50V A}$

0.1 μ F $\frac{104K}{50V h}$

(b) Tantalum, metallized, and electrolytic capacitors

Indication	Capacity
OR47	0.47 μ F
010	1 μ F
100	10 μ F
101	100 μ F

4.3 Ordering Information

When ordering parts, please give the following descriptions by referring to the Parts List.

Table 4-1 Ordering Information

Item	Example		
(1)	Name of Instrument	MULTI PLEXER MH676A	
(2)	Name of Parts List	Parts List: Z2 MUX INPUT	
(3)	CKT REF	C3	
(4)	Name of Part	CK733B1H473K	
Note:			
Parts name is given in parentheses () in the Parts List. Parts with asterisk (*) are those that require factory adjustment after repair. When ordering a part or parts with an asterisk, give a full description of the part.			
(5)	Quantity	1	
(6)	Serial No. of Instrument	M31257	

() : Manufacturer's part number
 * : Selected at factory
 4-7

CKT	REF	DESCRIPTION	RATING	NOTE
G 1		Gan, (FBP-06B-12L)		
J 1		Connector, (PI011-03F)		
J 2		Connector, (HIF3BA5B-34D-AA46S)		
J 3		Connector, (HRM-208B)		
J 4		Connector, (HRM-208B)		
J 5		Connector, (HRM-208B)		
J 6		Connector, (NM11-2F)		
J 7		Connector, (NM11-2F)		
J 8		Connector, (NM11-2F)		
J 9		Connector, (NM11-2F)		
J 10		Connector, (NM11-2F)		
J 11		Connector, (NM11-2F)		
J 12		Connector, (BNC-PJ2-NI)		
J 13		Connector, (BNC-PJ2-NI)		
J 14		Connector, (BNC-PJ2-NI)		
J 15		Connector, (NM27-2F)		
J 16		Connector, (NM27-2F)		
J 17		Connector, (HRM556S)		
J 18		Connector, (HRM556S)		
Z 1		MUX OUTPUT		
Z 2		MUX INPUT		
Z 3		CONTROL		
Z 4		POWER SUPPLY		
Z 5		MOTHER BOARD		
Z 6		DISPLAY		
Z 7		Not assigned		
Z 8		Not assigned		
Z 9		Not assigned		
Z 10		Not assigned		
Z 11		Not assigned		
Z 12		Not assigned		
Z 13		GP-IB		
Z 14		RS-232C		
44W83350				
44W83351				
44W83352				
44W83353				
44W83354				
44W83360				
44W83046				
44W83047				

() : Manufacturer's part number
* : Selected at factory
4-8
44W83354
1/1

CKT REF	DESCRIPTION	RATING	NOTE
J 1	Connector, (225J-23621-587)		
J 2	Connector, (225J-23621-587)		
J 3	Connector, (225J-23621-587)		
J 4	Connector, (225J-23621-587)		
J 5	Pattern (225J-23621-587)		

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() : Manufacturer's part number
* : Selected at factory

CKT	REF	DESCRIPTION	RATING	NOTE
C 1		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C 2		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C 3		Elect, (ECEB1HG221S)	220 μ F, +50/-20%, 50V	0'ty 0 to 2, *
C 4		Elect, (ECEB1HG221S)	220 μ F, +50/-20%, 50V	0'ty 0 to 2, *
C 5		Elect, (ECEB1HG221S)	220 μ F, +50/-20%, 50V	0'ty 0 to 2, *
C 6		Elect, (ECEB1HG221S)	220 μ F, +50/-20%, 50V	0'ty 0 to 2, *
C 7		Cer, (CK924C1H * M)	1000p to 0.1 μ F, \pm 20%, 50V	0'ty 0 to 2, *
C 8		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C 9		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C10		Cer, (CK924C1H * M)	1000p to 0.1 μ F, \pm 20%, 50V	0'ty 0 to 2, *
C11		Cer, (CK924C1H * M)	1000p to 0.1 μ F, \pm 20%, 50V	0'ty 0 to 2, *
C12		Elect, (CE04C1J4R7)	4.7 μ F, \pm 20%, 63V	0'ty 0 to 2, *
C13		Cer, (CC924CH1H221J)	220pF, \pm 5%, 50V	0'ty 0 to 2, *
C14		Elect, (CE04C1J2R2)	2.2 μ F, \pm 20%, 63V	0'ty 0 to 2, *
C15		Elect, (CE04C1J2R2)	2.2 μ F, \pm 20%, 63V	0'ty 0 to 2, *
C16		Elect, (ECEB1HG221S)	220 μ F, +50/-20%, 50V	0'ty 0 to 2, *
C17		Elect, (CE02C1J101)	100 μ F, \pm 20%, 63V	0'ty 0 to 2, *
C18		Elect, (ECEB1HG221S)	220 μ F, +50/-20%, 50V	0'ty 0 to 2, *
C19		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C20		Elect, (CE04C1C330)	33 μ F, \pm 20%, 16V	0'ty 0 to 2, *
C21		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C22		Elect, (CE04C1C330)	33 μ F, \pm 20%, 16V	0'ty 0 to 2, *
C23		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C24		Elect, (CE04C1A470)	47 μ F, \pm 20%, 10V	0'ty 0 to 2, *
C25		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C26		Elect, (ECEB1AG102S)	1000 μ F, +50/-20%, 10V	0'ty 0 to 2, *
C27		Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	0'ty 0 to 2, *
C28		Plast, (EQ-Q-P1 * FZ)	1000p to 0.0168 μ F, \pm 1%, 50V	0'ty 0 to 2, *
C29		Elect, (ECEB1CG102S)	1000 μ F, +50/-20%, 16V	0'ty 0 to 2, *
C30		Elect, (ECEB1CG102S)	1000 μ F, +50/-20%, 16V	0'ty 0 to 2, *
C31		Elect, (ECEB1CG102S)	1000 μ F, +50/-20%, 16V	0'ty 0 to 2, *
C32		Elect, (ECEB1AG102S)	1000 μ F, +50/-20%, 10V	0'ty 0 to 2, *
F 1		Fuse, (MF51NN250V)	250V, 0.5A	0'ty 0 to 2, *
F 2		Fuse, (MF51NN250V)	250V, 0.5A	0'ty 0 to 2, *
F 3		Fuse, (MF51NN250V)	250V, 2A	0'ty 0 to 2, *
F 4		Fuse, (MF51NN250V)	250V, 2A	0'ty 0 to 2, *

() : Manufacturer's part number
 * : Selected at factory

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CH1	REF	DESCRIPTION	RATING	NOTE
F 5		Fuse, (MFS1NN250V ZADC01)	250V, 2A	
J 1		Pattern		
J 2		Connector, (PI-021-03M)		
L 1		Coil, (HP-023)		
L 2		Coil, (HP-023)		
L 3		Coil, (LH1-471K)		
L 4		Coil, (LH1-471K)		
L 5		Coil, (SC-10-100)		
L 6		Coil, (SKL-103A)		
L 7		Coil, (SKL-103A)		
Q 1		IC, (uPC16312H)		
Q 2		IC, (uPC14312H)		
Q 3		DI, (1S1300)		
Q 4		IC, (uPC451C)		
Q 5		DI, (02BZ2.2)		
Q 6		IC, (PC618)		
Q 7		Not assigned		
Q 8		IC, (S10SC4MR)		
Q 9		IC, (uPC1042C)		
Q 10		Rectifier, (S5KC20HR)		
Q 11		Rectifier, (S5KC20H)		
Q 12		Rectifier, (S5KC20H)		
Q 13		Rectifier, (S5KC20H)		
Q 14		DI, (V03G)		
Q 15		DI, breakdown, (RD13EB)	12.4 to 14.1V, 400mW	
Q 16		Tr, (2SC1008L)	8.5 to 9.6V, 1W	
Q 17		DI, breakdown, (RD9.1FB)	10.4 to 11.6V, 1W	
Q 18		DI, breakdown, (RD11FB)		
Q 19		IC, (S10SC4M)		
Q 20		Tr, (2SA780AK)		
Q 21		Tr, (2SA780AK)		
Q 22		Not assigned		
Q 23		Tr, (2SC3164)		
Q 24		DI, (1S955)		
Q 25		DI, (1S955)		
Q 26		Tr, (2SC3164)		
Q 27		DI, (1S955)		

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* : Selected at factory

() : Manufacturer's part number

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REF	CKT	DESCRIPTION	RATING	NOTE
Q28		DI, (1S955)		
Q29		DI, (1S955)		
Q30		DI, (1S955)		
Q31		DI, (V03G)		
Q32		DI, (V03G)		
Q33		DI, (1SS97)		
Q34		DI, (1SS97)		
R1		Not assigned		
R2		Not assigned		
R3		Not assigned		
R4		MF, (RN14K2H332J)		
R5		CF, (ARD25T102J)		
R6		Var, MF, (RJ-6S 1K Ω)		
R7		CF, (ARD25T471J)		
R8		CF, (ARD25T * J)		
R9		CF, (ARD25T103J)		
R10		CF, (ARD25T * J)		
R11		CF, (ARD25T331J)		
R12		Not assigned		
R13		CF, (ARD25T472J)		
R14		CF, (ARD25T472J)		
R15		CF, (ARD25T * J)		
R16		CF, (ARD25T473J)		
R17		CF, (ARD25T223J)		
R18		CF, (ARD25T472J)		
R19		CF, (ARD25T * J)		
R20		CF, (ARD25T473J)		
R21		Not assigned		
R22		CF, (ARD25T102J)		
R23		CF, (ARD25T102J)		
R24		MF, (RS1FB3.3K Ω J)		
R25		CF, (ARD25T151J)		
R26		MF, (RS2FB1K Ω J)		
R27		CF, (ARD25T221J)		
R28		MF, (RS1FB47 Ω J)		
R29		Not assigned		
R30		CF, (ARD25T * J)		
R1		Not assigned		
R2		Not assigned		
R3		Not assigned		
R4		1K Ω , \pm 5%, 1/2W		
R5		1K Ω , \pm 5%, 1/4W		
R6		470 Ω , \pm 5%, 1/4W		
R7		1K Ω , 1/2W		
R8		470 Ω , \pm 5%, 1/4W		
R9		4.7 to 100K Ω , \pm 5%, 1/4W		
R10		10K Ω , \pm 5%, 1/4W		
R11		100K to 1M Ω , \pm 5%, 1/4W		
R12		1/4W		
R13		330 Ω , \pm 5%, 1/4W		
R14		4.7K Ω , \pm 5%, 1/4W		
R15		4.7K Ω , \pm 5%, 1/4W		
R16		22 to 100K Ω , \pm 5%, 1/4W		
R17		1/4W		
R18		47K Ω , \pm 5%, 1/4W		
R19		22K Ω , \pm 5%, 1/4W		
R20		4.7K Ω , \pm 5%, 1/4W		
R21		1 to 100K Ω , \pm 5%, 1/4W		
R22		47K Ω , \pm 5%, 1/4W		
R23		1K Ω , \pm 5%, 1/4W		
R24		1K Ω , \pm 5%, 1/4W		
R25		3.3K Ω , \pm 5%, 1W		
R26		150 Ω , \pm 5%, 1/4W		
R27		1K Ω , \pm 5%, 2W		
R28		220 Ω , \pm 5%, 1/4W		
R29		47 Ω , \pm 5%, 1W		
R30		10K to 1M Ω , \pm 5%, 1/4W		
Q'ty 0 or 1, *				
Q'ty 1 to 3, *				
Q'ty 1 to 3, *				
Q'ty 1 to 3, *				

() : Manufacturer's part number * : Selected at factory 4-12

CKT REF	DESCRIPTION	RATING	NOTE
R31	CF, (ARD25T470J)	470, ±5%, 1/4W	Q'ty 1 to 2, *
R32	CF, (ARD25T470J)	470, ±5%, 1/4W	Q'ty 1 or 2, *
R33	CF, (ARD25T * J)	10 to 1000, ±5%, 1/4W	Q'ty 0 to 2, *
R34	CF, (ARD25T * J)	10 to 1000, ±5%, 1/4W	Q'ty 0 to 2, *
R35	CF, (ARD25T * J)	6.8 to 220, ±5%, 1/4W	Q'ty 0 to 2, *
R36	CF, (ARD25T * J)	5.8 to 220, ±5%, 1/4W	Q'ty 0 to 2, *
R37	MF, (RS1FB220J)	220, ±5%, 1W	
T1	Trans, (44T75381)		
T2	Trans, (44T75381)		
T3	Trans, (44T86386)		
Z1	BATTERY, (BR6(AA))		

CKT	REF	DESCRIPTION	RATING	NOTE
C 1		Tant, (CS-E-1A4R7M)	4.7 μ F, \pm 20%, 10V	
C 2		Elect, (CE02C1G101)	100 μ , \pm 20%, 16V	
C 3		Elect, (CE02C1G101)	100 μ , \pm 20%, 16V	
C 4		Elect, (CE02C1A101)	100 μ , \pm 20%, 10V	
C 5				
C 24		Cer, (CK924C1H104M)	0.1 μ F, \pm 20%, 50V	
C 25		Tant, (CS-E-1D2R2M)	2.2 μ F, \pm 20%, 20V	
C 26		Cer, (CK924C1H104M)	0.1 μ F, \pm 20%, 50V	
C 27		Cer, (CK924C1H104M)	0.1 μ F, \pm 20%, 50V	
C 28		Cer, (CK924C1H104M)	0.1 μ F, \pm 20%, 50V	
C 29		Cer, (CK924C1H104M)	0.1 μ F, \pm 20%, 50V	
C 30		Cer, (CK924C1H104M)	0.1 μ F, \pm 20%, 50V	
C 31		Cer, (CK924C1H104M)	0.1 μ F, \pm 20%, 50V	
C 32		Cer, (CK924C1H104M)	0.1 μ F, \pm 20%, 50V	
C 33		Tant, (CS-E-1D2R2M)	2.2 μ F, \pm 20%, 20V	
C 34		Cer, (CG924CH1H471J)	470pF, \pm 5%, 50V	
C 35		Cer, (CG924CH1H471J)	470pF, \pm 5%, 50V	
J 1		Connector, (HIF3-34P-2.54DS)		
J 2		Connector, (HIF3-34P-2.54DS)		
J 3		Pattern		
Q 1		Tr, (2SC2901)		
Q 2		IC, (74LS14)		
Q 3		IC, (uPA79C)		
Q 4		IC, (uPD8279C-2)		
Q 5		IC, (LH0082A)		
Q 6		IC, (HA17008RP)		
Q 7		IC, (74LS244)		
Q 8		IC, (74LS244)		
Q 9		IC, (HM6264LP-15)		
Q 10		IC, (uPD8255AC-2)		
Q 11		IC, (HA17008RP)		
Q 12		IC, (uPC451C)		
Q 13		IC, (74154)		
Q 14		IC, (MBM2764-25)		
Q 15		IC, (uPD8255AC-2)		
Q 16		IC, (HA17008RP)		
Q 17		IC, (HA17008RP)		
Q 18		IC, (74LS244)		

() : Manufacturer's part number

* : Selected at factory

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() : Manufacturer's part number * : Selected at factory

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REF	DESCRIPTION	RATING	NOTE
Q19 to Q29	Tr, (2SA952)		
Q30	IC, (74LS244)		
Q31	IC, (74LS123)		
Q32	IC, (TL7705CPB)		
Q33	IC, (74LS245)		
Q34	IC, (74LS32)		
Q35	IC, (74LS14)		
Q36	IC, (74LS11)		
Q37	IC, (74LS138)		
Q38	IC, (74LS244)		
Q39	IC, (74LS139)		
Q40	IC, (74LS244)		
Q41	IC, (MPD780C-1)		
Q42	IC, (TC4093BP)		
Q43	IC, (74LS245)		
Q44	IC, (74LS244)		
Q45	IC, (uPC1251C)		
Q46	DI, breakdown, (1SZ52)	5.9 to 6.5V, 250mW	
Q47	DI, (1S953)		
Q48	IC, (7438)		
Q49	IC, (74LS74A)		
R1	Single in-line array, (IHR-8-472JA)	4.7k Ω x 8, 1/8W	
R2	CF, (ARD25T102J)	1k Ω , $\pm 5\%$, 1/4W	
R3	CF, (ARD25T222J)	2.2k Ω , $\pm 5\%$, 1/4W	
R4	Single in-line array, (IHR-8-220JB)	22 Ω x 8, 1/8W	
R5	MF, (RN14K2E2001D)	2k Ω , $\pm 0.5\%$, 1/4W	
R6	Single in-line array, (IHR-4-103JA)	10k Ω x 4, 1/8W	
R7	Single in-line array, (IHR-8-223JA)	22k Ω x 8, 1/8W	
R8	CF, (ARD25T222J)	2.2k Ω , $\pm 5\%$, 1/4W	
R9	MF, (RN14K2E2001D)	2.00k Ω , $\pm 0.5\%$, 1/4W	
R10	MF, (RN14K2E4991D)	4.99k Ω , $\pm 0.5\%$, 1/4W	
R11	MF, (RN14K2E4991D)	4.99k Ω , $\pm 0.5\%$, 1/4W	
R12	MF, (RN14K2E4991D)	4.99k Ω , $\pm 0.5\%$, 1/4W	
R13	MF, (RN14K2E4991D)	4.99k Ω , $\pm 0.5\%$, 1/4W	
R14	Single in-line array (IHR-6-331JB)	330 Ω x 6, 1/8W	
R15	CF, (ARD25T222J)	2.2k Ω , $\pm 5\%$, 1/4W	

CKT	REF	DESCRIPTION	RATING	NOTE
R16		MF, (RN14K2E2001D)	2K Ω , $\pm 0.5\%$, 1/4W	
R17		CF, (ARD25T222J)	2.2K Ω , $\pm 5\%$, 1/4W	
R18		MF, (RN14K2E2001D)	2K Ω , $\pm 0.5\%$, 1/4W	
R19		Single in-line array, (IHR-6-103JA)	10K Ω x 6, 1/8W	
R20		Single in-line array, (IHR-6-331JB)	330 Ω x 6, 1/8W	
R21		Single in-line array, (IHR-6-103JA)	10K Ω x 6, 1/8W	
R22		CF, (ARD25T104J)	100K Ω , $\pm 5\%$, 1/4W	
R23		CF, (ARD25T102J)	1K Ω , $\pm 5\%$, 1/4W	
R24		MF, (RN14K2E4991D)	4.99K Ω , $\pm 0.5\%$, 1/4W	
R25		CF, (ARD25T151J)	150 Ω , $\pm 5\%$, 1/4W	
R26		CF, (ARD25T103J)	10K Ω , $\pm 5\%$, 1/4W	
R27		CF, (ARD25T103J)	10K Ω , $\pm 5\%$, 1/4W	
R28		Var, MF, (RJ-6S 2K Ω)	2K Ω , 1/2W	
R29		MF, (RN14K2E3011D)	3.01K Ω , $\pm 0.5\%$, 1/4W	
R30		MF, (RN14K2E4991D)	4.99K Ω , $\pm 0.5\%$, 1/4W	
R31		CF, (ARD25T102J)	1K Ω , $\pm 5\%$, 1/4W	
R32		CF, (ARD25T102J)	1K Ω , $\pm 5\%$, 1/4W	
R33		CF, (ARD25T472J)	4.7K Ω , $\pm 5\%$, 1/4W	
S 1		Switch, (DIP-A(4))		
X 1		XTAL OSC, (TCO-707F(8MHZ))		

() : Manufacturer's part number

* : Selected at factory

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* : Selected at factory

() : Manufacturer's part number

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II/I

CKI REF	DESCRIPTION	RATING	NOTE
C 1	to Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C14			
C15	Not assigned		
C16	Not assigned		
C17	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C18	Cer, (CK732BH103K)	0.01µF, ±10%, 50V	
C19	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C20	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C21	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C22	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C23	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C24	Cer, (CK732BH103K)	0.01µF, ±10%, 50V	
C25	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C26	Not assigned		
C27	to		
C40	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C41	Not assigned		
C42	Not assigned		
C43	Cer, (CK732BH102K)	1000pF, ±10%, 50V	
C44	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C45	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C46	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C47	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C48	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C49	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C50	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C51	Cer, (CK924C1H104M)	0.1µF, ±20%, 50V	
C52	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C53	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C54	Cer, (CK924C1H104M)	0.1µF, ±20%, 50V	
C55	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C56	Not assigned		
C57	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C58	Cer, (CK924C1H104M)	0.1µF, ±20%, 50V	
C59	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C60	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C61	Cer, (CK924C1H104M)	0.1µF, ±20%, 50V	
C62	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C63	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C64	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C65	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C66	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	
C67	Cer, (CK733BH473K)	0.047µF, ±10%, 50V	

CKT	REF	DESCRIPTION	RATING	NOTE
C68		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C69		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C70		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C71		Not assigned		
C72		Not assigned		
C73		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C74		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C75		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C76		Cer, (CC732CH1H101J)	100pF, $\pm 5\%$, 50V	
C77		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C78		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C79		Cer, (CK732B1H103K)	0.01 μ F, $\pm 10\%$, 50V	
C80		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C81		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C82		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C83		Cer, (CK732B1H103K)	0.01 μ F, $\pm 10\%$, 50V	
C84		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C85		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C86		Cer, (CK732B1H103K)	0.01 μ F, $\pm 10\%$, 50V	
C87		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C88		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C89		Cer, (CC732CH1H101J)	100pF, $\pm 5\%$, 50V	
C90		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C91		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C92		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C93		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C94		Not assigned		
C95		Not assigned		
C96		Not assigned		
C97		Not assigned		
C98	to	Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C108				
C109		Elect, (CE04W1E470)	47 μ F, $\pm 20\%$, 25V	
C110		Elect, (CE04W1E470)	47 μ F, $\pm 20\%$, 25V	
C111		Elect, (CE04W1A470)	47 μ F, $\pm 20\%$, 10V	
C112		Elect, (CE04W1A470)	47 μ F, $\pm 20\%$, 10V	
C113		Elect, (CE04W1V4R7)	4.7 μ F, $\pm 20\%$, 35V	
C114		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C115		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C116		Tant, (CS734E0J476M)	470 μ F, $\pm 20\%$, 6.3V	
C117		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C118		Cer, (CC732CH1H101J)	100pF, $\pm 5\%$, 50V	
C119		Tant, (CS732E1V105M)	1 μ F, $\pm 20\%$, 35V	
C120		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	

() : Manufacturer's part number
 * : Selected at factory

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Parts List : Z2 MUX INPUT

() : Manufacturer's part number * : Selected at factory

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CKT	REF	DESCRIPTION	RATING	NOTE
C121		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C122		Cer, (CK732B1H103K)	0.01 μ F, $\pm 10\%$, 50V	
C123		Cer, (CK732CH1H * D)	5 to 10pF, ± 0.5 pF, 50V	Q'ty 1 to 3, *
C124		Cer, (CK732CH1H * D)	5 to 10pF, ± 0.5 pF, 50V	Q'ty 1 to 3, *
C125		Cer, (CC732CK1H020C)	2pF, ± 0.25 pF, 50V	
C126		Cer, (CC732CH1H060D)	6pF, ± 0.5 pF, 50V	
C127		Cer, (CC732CH1H060D)	6pF, ± 0.5 pF, 50V	
C128		Cer, (CC732CK1H020C)	2pF, ± 0.25 pF, 50V	
C129		Cer, (CK732B1H102K)	1000pF, $\pm 10\%$, 50V	
C130		Cer, (CK732B1H102K)	1000pF, $\pm 10\%$, 50V	
J 1		Pattern		
J 2		Connector, (HRM100-32S)		
J 3		Connector, (HRM100-32S)		
J 4		Connector, (HRM100-32S)		
J 5		Connector, (HRM100-32S)		
J 6		Connector, (HRM100-32S)		
L 1		Pattern		
L 2		Pattern		
L 3		Pattern		
L 4		Pattern		
L 5		Pattern		
L 6		Pattern		
M 1		Timer, (TM-O)		
Q 1		D1, (1S2835)		
Q 2		D1, (1S2837)		
Q 3		D1, (1S2835)		
Q 4		IC, (μ PA102G)		
Q 5		D1, (1S953)		
Q 6		D1, (1S2837)		
Q 7		D1, (1S2835)		
Q 8		IC, (PA104G)		
Q 9		Tr, (2SC3584)		
Q 10		Tr, (2SC3584)		
Q 11		Tr, (2SC3584)		
Q 12		D1, (1S2835)		
Q 13		IC, (μ PA102G)		
Q 14		Not assigned		
Q 15		IC, (μ PC1251C)		

* : Selected at factory

() : Manufacturer's part number

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CKT	REF	DESCRIPTION	RATING	NOTE
Q16		FET, (2SK406 (IDSS 50-65))		
Q17		FET, (2SK406 (IDSS 50-65))		
Q18		IC, (uPC1251C) Not assigned		
Q19		Not assigned		
Q20		D1, (1S2835)		
Q21		D1, (1S2837)		
Q22		D1, (1S2835)		
Q23		IC, (uPA102G) D1, (1S953)		
Q24		D1, (1S953)		
Q25		D1, (1S2837)		
Q26		D1, (1S2835)		
Q27		IC, (uPA104G)		
Q28		Tr, (2SC3584)		
Q29		Tr, (2SC3584)		
Q30		Tr, (2SC3584)		
Q31		D1, (1S2835)		
Q32		IC, (uPA102G)		
Q33		Not assigned		
Q34		D1, (1S2835)		
Q35		IC, (uPA102G)		
Q36		D1, (1S2835)		
Q37		IC, (uPA102G)		
Q38		D1, (1S2835)		
Q39		IC, (uPA102G)		
Q40		Tr, (2SC3584)		
Q41		D1, (1S2835)		
Q42		D1, (1S2835)		
Q43		IC, (uPA102G)		
Q44		D1, (1S99)		
Q45		D1, (1S99)		
Q46		IC, (uPC177C) Not assigned		
Q47		FET, (2SK406 (IDSS 50-65))		
Q48		FET, (2SK406 (IDSS 50-65))		
Q49		FET, (2SK406 (IDSS 50-65))		
Q50		FET, (2SK406 (IDSS 50-65))		
Q51		FET, (2SK406 (IDSS 50-65))		
Q52		FET, (2SK406 (IDSS 50-65))		
Q53		FET, (2SK406 (IDSS 50-65))		

* : Selected at factory

() : Manufacturer's part number

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REF	DESCRIPTION	RATING	NOTE
Q54	Not assigned		
Q55	Tr, (ZSA1154)		
Q56	IC, (uPC1251C)		
Q57	IC, (uPB582C)		
Q58	IC, (uPA102G)		
Q59	IC, (HD10231)		
Q60	D1, (1S953)		
Q61	IC, (HD10136)		
Q62	IC, (HD10125)		
Q63	IC, (uPC1251C)		
Q64	IC, (uPC1251C)		
Q65	IC, (74LS123)		
Q66	IC, (74LS74A)		
Q67	Not assigned		
Q68			
Q83	D1, (1S2208)		
R 1	Var, MF, (RJ-6F 500Q)	500Q, 1/2W	Q'ty 0 to 3, *
R 2	MF, (RM73B2B222JD)	2.2KQ, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 3	MF, (RM73B2B * JD)	0 to 100Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 4	MF, (RM73B2B820JD)	82Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 5	MF, (RM73B2B * JD)	0 to 220Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 6	MF, (RM73B2B * JD)	0 to 100Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 7	MF, (RM73B2B102JD)	1KQ, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 8	MF, (RM73B2B510JD)	51Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 9	MF, (RM73B2B102JD)	1KQ, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 10	MF, (RM73B2B102JD)	1KQ, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 11	MF, (RM73B2B510JD)	51Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 12	MF, (RM73B2B510JD)	51Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 13	MF, (RM73B2B102JD)	1KQ, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 14	MF, (RM73B2B222JD)	2.2KQ, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 15	MF, (RM73B2B * JD)	0 to 100Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 16	MF, (RM73B2B * JD)	0 to 221Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 17	MF, (RM73B2B102JD)	1KQ, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 18	MF, (RM73B2B121JD)	120Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 19	MF, (RM73B2B * JD)	0 to 100Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R 20	MF, (RM73B2B * JD)	0 to 100Q, $\pm 5\%$, 1/8W	Q'ty 0 to 3, *

CKT	REF	DESCRIPTION	RATING	NOTE
R21		MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R22		MF, (RM73B2B221JD)	220 Ω , $\pm 5\%$, 1/8W	
R23		MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W	
R24		MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W	
R25		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R26		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	
R27		Var, MF, (RJ-6P 500 Ω)	500 Ω , 1/2W	
R28		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R29		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	
R30		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	
R31		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R32		MF, (RM73B2B471JD)	470 Ω , $\pm 5\%$, 1/8W	Q'ty 0 to 3, *
R33		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	
R34		MF, (RM73B2B820JD)	82 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R35		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	
R36		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R37		MF, (RM73B2B471JD)	470 Ω , $\pm 5\%$, 1/8W	
R38		MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W	
R39		MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W	
R40		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	
R41		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R42		Not assigned		
R43		MF, (RM73B2B821JD)	820 Ω , $\pm 5\%$, 1/8W	
R44		MF, (RM73B2B152JD)	1.5K Ω , $\pm 5\%$, 1/8W	
R45		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R46		MF, (RM73B2B562JD)	5.6K Ω , $\pm 5\%$, 1/8W	
R47		Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W	
R48		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R49		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R50		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R51		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R52		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R53		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	
R54		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R55		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R56		MF, (RM73B2B * JD)	100 to 470 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R57		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R58		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	

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REF	DESCRIPTION	RATING	NOTE
R59	MF, (RM73B2B510JD)	510, ±5%, 1/8W	Q'ty 1 or
R60	MF, (RM63B2B472JD)	4.7kΩ, ±5%, 1/8W	Q'ty 1 or
R61	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	Q'ty 1 or
R62	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	Q'ty 1 or
R63	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	Q'ty 1 or
R64	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	Q'ty 1 or
R65	Var, MF, (RJ-6P 5kΩ)	5kΩ, 1/2W	Q'ty 1 or
R66	MF, (RM73B2B562JD)	5.6kΩ, ±5%, 1/8W	Q'ty 1 or
R67	MF, (RM73B2B821JD)	820Ω, ±5%, 1/8W	Q'ty 1 or
R68	Var, MF, (RJ-6P 1kΩ)	1kΩ, 1/2W	Q'ty 1 or
R69	MF, (RM73B2B152JD)	1.5kΩ, ±5%, 1/8W	Q'ty 1 or
R70	Not assigned		Q'ty 1 or
R71	Not assigned		Q'ty 1 or
R72	Var, MF, (RJ-6P 500Ω)	500Ω, 1/2W	Q'ty 1 or
R73	MF, (RM73B2B222JD)	2.2kΩ, ±5%, 1/8W	Q'ty 1 or
R74	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or
R75	MF, (RM73B2B820JD)	82Ω, ±5%, 1/8W	Q'ty 1 or
R76	MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	Q'ty 1 or
R77	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or
R78	MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	Q'ty 1 or
R79	MF, (RM73B2B510JD)	510, ±5%, 1/8W	Q'ty 1 or
R80	MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	Q'ty 1 or
R81	MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	Q'ty 1 or
R82	MF, (RM73B2B510JD)	510, ±5%, 1/8W	Q'ty 1 or
R83	MF, (RM73B2B510JD)	510, ±5%, 1/8W	Q'ty 1 or
R84	MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	Q'ty 1 or
R85	MF, (RM73B2B222JD)	2.2kΩ, ±5%, 1/8W	Q'ty 1 or
R86	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or
R87	MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	Q'ty 1 or
R88	MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	Q'ty 1 or
R89	MF, (RM73B2B121JD)	120Ω, ±5%, 1/8W	Q'ty 1 or
R90	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or
R91	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or
R92	MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	Q'ty 1 or
R93	MF, (RM73B2B221JD)	220Ω, ±5%, 1/8W	Q'ty 1 or
R94	MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	Q'ty 1 or
R95	MF, (RM73B2B222JD)	2.2kΩ, ±5%, 1/8W	Q'ty 1 or
R96	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or

CKT	REF	DESCRIPTION	RATING	NOTE
R97	MR, (RM73B2B510JD)	510, ±5%, 1/8W	510, ±5%, 1/8W	0'ty 1 or 1, *
R98	Var, MF, (RJ-6P 500Ω)	500Ω, 1/2W	0 to 100Ω, ±5%, 1/8W	0'ty 1 or 1, *
R99	MF, (RM73B2B * JD)			
R100	MF, (RM73B2B510JD)	510, ±5%, 1/8W	510, ±5%, 1/8W	
R101	MF, (RM73B2B510JD)	510, ±5%, 1/8W	510, ±5%, 1/8W	
R102	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	0 to 100Ω, ±5%, 1/8W	0'ty 1 or 1, *
R103	Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	1KΩ, 1/2W	
R104	MF, (RM73B2B471JD)	470Ω, ±5%, 1/8W	470Ω, ±5%, 1/8W	0'ty 0 to 3, *
R105	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	0 to 100Ω, ±5%, 1/8W	0'ty 0 to 3, *
R106	MF, (RM73B2B820JD)	820, ±5%, 1/8W	820, ±5%, 1/8W	0'ty 0 to 3, *
R107	MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	0 to 220Ω, ±5%, 1/8W	0'ty 0 to 3, *
R108	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	0 to 100Ω, ±5%, 1/8W	0'ty 0 to 3, *
R109	MF, (RM73B2B471JD)	470Ω, ±5%, 1/8W	470Ω, ±5%, 1/8W	
R110	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	1KΩ, ±5%, 1/8W	
R111	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	1KΩ, ±5%, 1/8W	
R112	MF, (RM73B2B510JD)	510, ±5%, 1/8W	510, ±5%, 1/8W	
R113	Not assigned			
R114	Not assigned			
R115	Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	1KΩ, 1/2W	
R116	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	0 to 100Ω, ±5%, 1/8W	0'ty 0 to 3, *
R117	MF, (RM73B2B152JD)	1.5KΩ, ±5%, 1/8W	1.5KΩ, ±5%, 1/8W	
R118	MF, (RM73B2B101JD)	100Ω, ±5%, 1/8W	100Ω, ±5%, 1/8W	0'ty 0 to 3, *
R119	MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	0 to 220Ω, ±5%, 1/8W	0'ty 0 to 3, *
R120	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	0 to 100Ω, ±5%, 1/8W	0'ty 0 to 3, *
R121	MF, (RM73B2B510JD)	510, ±5%, 1/8W	510, ±5%, 1/8W	
R122	MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	2.2KΩ, ±5%, 1/8W	
R123	MF, (RM73B2B471JD)	470Ω, ±5%, 1/8W	470Ω, ±5%, 1/8W	
R124	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	1KΩ, ±5%, 1/8W	
R125	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	1KΩ, ±5%, 1/8W	
R126	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	1KΩ, ±5%, 1/8W	
R127	MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	2.2KΩ, ±5%, 1/8W	
R128	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	0 to 100Ω, ±5%, 1/8W	0'ty 0 to 3, *
R129	MF, (RM73B2B820JD)	820, ±5%, 1/8W	820, ±5%, 1/8W	0'ty 0 to 3, *
R130	MF, (RM73B2B * JD)	0 to 221Ω, ±5%, 1/8W	0 to 221Ω, ±5%, 1/8W	0'ty 0 to 3, *

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REF	DESCRIPTION	RATING	NOTE
R131	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R132	MF, (RM73B2B561JD)	560Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R133	MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R134	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R135	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R136	MF, (RM73B2B561JD)	560Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R137	MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R138	MF, (RM73B2B561JD)	560Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R139	MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R140	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R141	MF, (RM73B2B820JD)	82Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R142	MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R143	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R144	MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R145	MF, (RM73B2B561JD)	560Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R146	MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R147	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R148	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R149	MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R150	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R151	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R152	MF, (RM73B2B820JD)	82Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R153	MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R154	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R155	MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R156	MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R157	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R158	MF, (RM73B2B331JD)	330Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R159	MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R160	MF, (RM73B2B104JD)	100KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R161	MF, (RM73B2B331JD)	330Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R162	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R163	MF, (RM73B2B332JD)	3.3KΩ, ±5%, 1/8W	Q'ty 0 to 3, *
R164	Not assigned		
R165	Not assigned		
R166	MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	Q'ty 0 to 3, *
R167	MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	Q'ty 0 to 3, *

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CKT	REF	DESCRIPTION	RATING	NOTE
R168	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R169	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R170	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R171	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R172	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R173	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R174	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R175	MF, (RM73B2B471JD)	470 Ω , $\pm 5\%$, 1/8W		
R176	MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W		
R177	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R178	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R179	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R180	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R181	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R182	MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W		
R183	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R184	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R185	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R186	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R187	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R188	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R189	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R190	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R191	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R192	MF, (RM73B2B471JD)	470 Ω , $\pm 5\%$, 1/8W		
R193	MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W		
R194	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R195	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R196	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R197	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R198	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R199	Not assigned			
R200	Not assigned			
R201	MF, (RM73B2B332JD)	3.3K Ω , $\pm 5\%$, 1/8W		
R202	MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W		
R203	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R204	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R205	MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W		
R206	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R207	MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W		
R208	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R209	MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W		
R210	MF, (RM73B2B272JD)	2.7K Ω , $\pm 5\%$, 1/8W		
R211	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R212	MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W		

Qty 0 to 3, *

CKT	REF	DESCRIPTION	RATING	NOTE
R213		MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	0'ty 0 to 3, *
R214		MF, (RM73B2B121JD)	120Ω, ±5%, 1/8W	0'ty 0 to 3, *
R215		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	0'ty 0 to 3, *
R216		MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	
R217		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R218		MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	
R219		MF, (RM73B2B332JD)	3.3kΩ, ±5%, 1/8W	
R220		MF, (RM73B2B471JD)	470Ω, ±5%, 1/8W	
R221		MF, (RM73B2B471JD)	470Ω, ±5%, 1/8W	
R222		MF, (RM73B2B471JD)	470Ω, ±5%, 1/8W	
R223		MF, (RM73B2B471JD)	470Ω, ±5%, 1/8W	
R224		MF, (RM73B2B471JD)	470Ω, ±5%, 1/8W	
R225		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R226		MF, (RM73B2B475JD)	4.75kΩ, ±0.5%, 1/4W	
R227		MF, (RM73B2B340JD)	3.40kΩ, ±0.5%, 1/4W	
R228		Var, MF, (RJ-6P 2kΩ)	2kΩ, 1/2W	
R229		Var, MF, (RJ-6P 2kΩ)	2kΩ, 1/2W	
R230		MF, (RM73B2B100JD)	1kΩ, ±0.5%, 1/4W	
R231		MF, (RM73B2B473JD)	47kΩ, ±5%, 1/8W	
R232		MF, (RM73B2B473JD)	47kΩ, ±5%, 1/8W	
R233		MF, (RM73B2B100JD)	1kΩ, ±0.5%, 1/4W	
R234		MF, (RM73B2B105JD)	1MΩ, ±5%, 1/8W	
R235		MF, (RM73B2B102JD)	1kΩ, ±0.5%, 1/8W	
R236		MF, (RM73B2B822JD)	8.2kΩ, ±5%, 1/8W	
R237		MF, (RM73B2B152JD)	1.5kΩ, ±5%, 1/8W	
R238		MF, (RM73B2B123JD)	12kΩ, ±5%, 1/8W	
R239		Var, MF, (RJ-6P 2kΩ)	2kΩ, 1/2W	
R240		MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R241		MF, (RM73B2B332JD)	3.3kΩ, ±5%, 1/8W	
R242		Var, MF, (RJ-6P 5kΩ)	5kΩ, 1/2W	
R243		MF, (RM73B2B272JD)	2.7kΩ, ±5%, 1/8W	
R244		Var, MF, (RJ-6P 20kΩ)	20kΩ, 1/2W	
R245		MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R246		MF, (RM73B2B332JD)	3.3kΩ, ±5%, 1/8W	
R247		MF, (RM73B2B104JD)	100kΩ, ±5%, 1/8W	
R248		Not assigned		
R249		MF, (RM73B2B331JD)	330Ω, ±5%, 1/8W	
R250		MF, (RM73B2B331JD)	330Ω, ±5%, 1/8W	
R251		MF, (RM73B2B180JD)	18Ω, ±5%, 1/8W	
R252		CF, (ARD25T103J)	10kΩ, ±5%, 1/4W	
R267				
R268		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R269		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	

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CKT	REF	DESCRIPTION	RATING	NOTE
C64		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C65		Cer, (CK732BH103K)	0.01 μ F, \pm 10%, 50V	
C66		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C67		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C68		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C69		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C70		Cer, (CK733BH223K)	0.022 μ F, \pm 10%, 50V	
C71		Not assigned		
C72		Cer, (CK732BH102K)	1000pF, \pm 10%, 50V	
C73		Cer, (CK732BH102K)	1000pF, \pm 10%, 50V	
C74		Cer, (CK732BH102K)	1000pF, \pm 10%, 50V	
C75		Cer, (CC732CH101J)	100pF, \pm 5%, 50V	
C76		Cer, (CK732BH102K)	1000pF, \pm 10%, 50V	
C77		Cer, (CK732BH102K)	1000pF, \pm 10%, 50V	
C78		Cer, (CK732BH102K)	1000pF, \pm 10%, 50V	
C79		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C80		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C81		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C82		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C83		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C84		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C85		Elect, (CE04W1E470)	47 μ F, \pm 20%, 25V	
C86		Elect, (CE04W1E470)	47 μ F, \pm 20%, 25V	
C87		Elect, (CE04W1A470)	47 μ F, \pm 20%, 10V	
C88		Elect, (CE04W1A470)	47 μ F, \pm 20%, 10V	
C89		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C90		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C91		Not assigned		
C92		Not assigned		
C93		Cer, (CK732BH103K)	0.01 μ F, \pm 10%, 50V	
C94		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C95		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C96		Tant, (CS734E0J476M)	47 μ F, \pm 20%, 6.3V	
C97		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C98		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C99		Tant, (CS732E1A475M)	47 μ F, \pm 20%, 10V	
C100		Tant, (CS732E1A475M)	47 μ F, \pm 20%, 10V	
C101		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C102		Tant, (CS732E1A475M)	47 μ F, \pm 20%, 10V	
J 1		Pattern		
J 2		Connector, (HRM100-32S)		
J 3		Connector, (HRM100-32S)		
J 4		Connector, (HRM100-32S)		
J 5		Connector, (HRM100-32S)		

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REF	DESCRIPTION	RATING	NOTE
CKT			
K 1	Relay, (PGIC-12)		
K 2	Relay, (PGIC-12)		
K 3	Relay, (PGIC-12)		
L 1	Coil, (439T16820)		
L 2	Coil, (442T38894C)		
L 3	Coil, (442T56877B)		
L 4	Coil, (442T56877A)		
L 5	Coil, (439T16820)		
L 6	Coil, (442T56877A)		
L 7	Coil, (442T56877B)		
L 8	Coil, (442T38894C)		
L 9	Coil, (439T16820)		
L 10	Coil, (442T38894C)		
L 11	Coil, (442T56877B)		
L 12	Coil, (442T56877A)		
L 13	Coil, (439T16820)		
L 14	Coil, (442T56877A)		
L 15	Coil, (442T68777B)		
L 16	Coil, (442T38894C)		
Q 1	Tr, (2SA1154)		
Q 2	IC, (uPC1251C)		
Q 3	Tr, (2SA1154)		
Q 4	Tr, (1S2835)		
Q 5	FET, (2SK406)		
Q 6	DI, (1S2835)		
Q 7	IC, (10G021AL(2GHZ))		
Q 8	FET, (2SK406)		
Q 9	FET, (2SK406)		
Q 10	IC, (uPC1251C)		
Q 11	IC, (uPC1251C)		
Q 12	FET, (2SK406)		
Q 13	FET, (2SK406)		
Q 14	FET, (2SK406)		
Q 15	FET, (2SK406)		

CKT	DESCRIPTION	RATING	NOTE
Q16	FET, (2SK406 (IDSS 50-65))		
Q17	FET, (2SK406 (IDSS 50-65))		
Q18	FET, (2SK406 (IDSS 50-65))		
Q19	IC, (HD75451AP) (IDSS 50-65))		
Q20	Not assigned		
Q21	FET, (2SK406 (IDSS 65-120))		
Q22	FET, (2SK406 (IDSS 65-120))		
Q23	D1, (1SS123 (IDSS 65-120))		
Q24	FET, (2SK406 (IDSS 65-120))		
Q25	FET, (2SK406 (IDSS 65-120))		
Q26	D1, (1SS123) D1, (1SS123)		
Q27	D1, (1SS123)		
Q28	IC, (uPC451C)		
Q29	IC, (HA2-5033-5) IC, (uPC1251C)		
Q30	IC, (uPC1251C)		
Q31	Not assigned		
Q32	FET, (2SK406 (IDSS 65-120))		
Q33	FET, (2SK406 (IDSS 65-120))		
Q34	D1, (1SS123) FET, (2SK406 (IDSS 65-120))		
Q35	FET, (2SK406 (IDSS 65-120))		
Q36	Tr, (2SA1151) Tr, (2SA1151)		
Q37	Tr, (2SA1151)		
Q38	IC, (uPC1251C)		
Q39	IC, (uPC1251C)		
Q40	IC, (HA2-5033-5) IC, (uPC1251C)		
Q41	IC, (uPC1251C)		
Q42	IC, (uPC1251C)		
Q43	IC, (uPC451C)		
Q44	Tr, (2SD882)		
Q45	Tr, (2SD882)		
Q46	Tr, (2SD882)		
Q47	IC, (uPC451C)		
Q48	IC, (HI-201-5)		
Q49	D1, (1SS123 (A7))		
Q50	D1, (1SS123 (A7))		
Q51	D1, (1SS123 (A7))		
Q52	D1, (1SS123 (A7))		

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REF	CKT	DESCRIPTION	RATING	NOTE
R 1	MF, (RM73B2B182JD)	1.8K Ω , $\pm 5\%$, 1/8W		
R 2	MF, (RM73B2B332JD)	3.3K Ω , $\pm 5\%$, 1/8W		
R 3	MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W		
R 4	MF, (RM73B2B101JD)	1K Ω , $\pm 5\%$, 1/8W		
R 5	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R 6	MF, (RM73B2B332JD)	3.3K Ω , $\pm 5\%$, 1/8W		
R 7	MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W		
R 8	MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W		
R 9	MF, (RM73B2B331JD)	330 Ω , $\pm 5\%$, 1/8W		
R 10	MF, (RM73B2B470JD)	47 Ω , $\pm 5\%$, 1/8W		
R 11	MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W		
R 12	Var, MF, (RJ-6P 100 Ω)	100 Ω , 1/2W		
R 13	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R 14	MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W		
R 15	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R 16	MF, (RM73B2B * JD)	100 to 470 Ω , $\pm 5\%$, 1/8W		0'ty 1 or 1, *
R 17	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R 18	Not assigned			
R 19	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R 20	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R 21	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R 22	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R 23	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R 24	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R 25	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R 26	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R 27	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R 28	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R 29	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R 30	MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W		
R 31	Not assigned			
R 32	Not assigned			
R 33	Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W		
R 34	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R 35	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R 36	MF, (RM73B2B562JD)	5.6K Ω , $\pm 5\%$, 1/8W		
R 37	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R 38	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R 39	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R 40	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R 41	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R 42	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R 43	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		

CKT	REF	DESCRIPTION	RATING	NOTE
R44	MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W		
R45	Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W		
R46	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R47	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R48	MF, (RM73B2B562JD)	5.6K Ω , $\pm 5\%$, 1/8W		
R49	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R50	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R51	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R52	MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W		
R53	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R54	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R55	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R56	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R57	MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W		
R58	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R59	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R60	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R61	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R62	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R63	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R64	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R65	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R66	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R67	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R68	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R69	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R70	MF, (RM73B2B * JD)	51 to 150 Ω , $\pm 5\%$, 1/8W		
R71	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R72	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R73	MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R74	Not assigned			
R75	Not assigned			
R76	Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W		
R77	MF, (RM72B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W		
R78	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R79	MF, (RM73B2B * JD)	51 to 100 Ω , $\pm 5\%$, 1/8W		
R80	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		
R81	MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W		
R82	MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W		
R83	MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W		

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CKT	REF	DESCRIPTION	RATING	NOTE
R84		MF, (RM73B2B332JD)	3.3k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R85		MF, (RM73B2B332JD)	3.3k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R86		Var, MF, (RJ-6P 500 Ω)	500 Ω , 1/2W	Q'ty 1 or 1, *
R87		MF, (RM73B2B470JD)	47 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R88		MF, (RM73B2B * JD)	100 Ω to 100k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R89		MF, (RM73B2B * JD)	100 Ω to 100k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R90		Not assigned		Q'ty 1 or 1, *
R91		MF, (RM73B2B * JD)	100 Ω to 100k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R92		MF, (RM73B2B * JD)	51 to 470 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R93		MF, (RM73B2B * JD)	100 Ω to 1k Ω , $\pm 5\%$, 1/8W	Q'ty 0 or 1, *
R94		MF, (RM73B2B * JD)	100 Ω to 100k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R95		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R96		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R97		MF, (RM73B2B472JD)	4.7k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R98		MF, (RM73B2B103JD)	10k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R99		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R100		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R101		MF, (RM73B2B103JD)	10k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R102		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R103		MF, (RM73B2B472JD)	4.7k Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R104		MF, (RM73B2B103JD)	10k Ω , $\pm 5\%$, 1/8W	
R105		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	
R106		Not assigned		
R107		MF, (RM73B2B392JD)	3.9k Ω , $\pm 5\%$, 1/8W	
R108		MF, (RM73B2B392JD)	3.9k Ω , $\pm 5\%$, 1/8W	
R109		MF, (RM73B2B392JD)	3.9k Ω , $\pm 5\%$, 1/8W	
R110		MF, (RM73B2B392JD)	3.9k Ω , $\pm 5\%$, 1/8W	
R111		Var, MF, (RJ-6P 5k Ω)	5k Ω , 1/2W	
R112		MF, (RM73B2B332JD)	3.3k Ω , $\pm 5\%$, 1/8W	
R113		MF, (RM73B2B562JD)	5.6k Ω , $\pm 5\%$, 1/8W	
R114		Var, MF, (RJ-6P 1k Ω)	1k Ω , 1/2W	
R115		MF, (RM73B2B332JD)	3.3k Ω , $\pm 5\%$, 1/8W	
R116		MF, (RM73B2B103JD)	10k Ω , $\pm 5\%$, 1/8W	
R117		MF, (RM73B2B103JD)	10k Ω , $\pm 5\%$, 1/8W	
R118		MF, (RM73B2B103JD)	10k Ω , $\pm 5\%$, 1/8W	
R119		MF, (RM73B2B103JD)	10k Ω , $\pm 5\%$, 1/8W	
R120		MF, (RM73B2B472JD)	4.7k Ω , $\pm 5\%$, 1/8W	

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CKT	REF	DESCRIPTION	RATING	NOTE
R121		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R122		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R123		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R124		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R125		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R126		Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W	
R127		MF, (RM73B2B332JD)	3.3K Ω , \pm 5%, 1/8W	
R128		MF, (RM73B2B682JD)	6.8K Ω , \pm 5%, 1/8W	
R129		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R130		MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R131		Not assigned		
R132		Not assigned		
R133		Var, MF, (RJ-6P 500 Ω)	500 Ω , 1/2W	
R134		MF, (RM73B2B470JD)	47 Ω , 5%, 1/8W	
R135		MF, (RM73B2B * JD)	100 Ω to 100K Ω , \pm 5%, 1/8W	Q'ty 1 or 1, *
R136		MF, (RM73B2B * JD)	100 Ω to 100K Ω , \pm 5%, 1/8W	Q'ty 1 or 1, *
R137		MF, (RM73B2B * JD)	100 Ω to 100K Ω , \pm 5%, 1/8W	Q'ty 1 or 1, *
R138		MF, (RM73B2B * JD)	51 Ω to 470 Ω , \pm 5%, 1/8W	Q'ty 1 or 1, *
R139		MF, (RM73B2B * JD)	100 Ω to 1K Ω , \pm 5%, 1/8W	Q'ty 1 or 1, *
R140		MF, (RM73B2B * JD)	100 Ω to 100K Ω , \pm 5%, 1/8W	Q'ty 1 or 1, *
R141		MF, (RM73B2B510JD)	51 Ω , \pm 5%, 1/8W	
R142		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R143		MF, (RM73B2B510JD)	51 Ω , \pm 5%, 1/8W	
R144		MF, (RM73B2B510JD)	51 Ω , \pm 5%, 1/8W	
R145		MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R146		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R147		MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R148		MF, (RM73B2B510JD)	51 Ω , \pm 5%, 1/8W	
R149		MF, (RM73B2B392JD)	3.9K Ω , \pm 5%, 1/8W	
R150		MF, (RM73B2B392JD)	3.9K Ω , \pm 5%, 1/8W	
R151		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R152		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R153		MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R154		MF, (RM73B2B332JD)	3.3K Ω , \pm 5%, 1/8W	
R155		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R156		MF, (RM73B2B101JD)	100 Ω , \pm 5%, 1/8W	
R157		MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R158		MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R159		MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R160		MF, (RM73B2B471JD)	470 Ω , \pm 5%, 1/8W	

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NOTE

R161	Not assigned		
R162	Not assigned		
R163	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R164	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R165	MF, (RM73B2B101JD)	100 Ω , \pm 5%, 1/8W	
R166	MF, (RM73B2B101JD)	100 Ω , \pm 5%, 1/8W	
R167	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R168	MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R169	MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R170	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R171	MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R172	MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R173	MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R174	MF, (RM73B2B103JD)	10K Ω , \pm 5%, 1/8W	
R175	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R176	Var, MF, (RJ-6P 1K Ω)	1K Ω , \pm 1/2W	
R177	Var, MF, (RJ-6P 1K Ω)	1K Ω , \pm 1/2W	
R178	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R179	Var, MF, (RJ-6P 2K Ω)	2K Ω , 1/2W	
R180	Var, MF, (RJ-6P 2K Ω)	2K Ω , 1/2W	
R181	MF, (RM73B2B472JD)	4.7K Ω , 5%, 1/8W	
R182	MF, (RM73B2B153JD)	15K Ω , \pm 5%, 1/8W	
R183	MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R184	Var, MF, (RJ-6P 10K Ω)	10K Ω , 1/2W	
R185	MF, (RM73B2B223JD)	22K Ω , \pm 5%, 1/8W	
R186	MF, (RM73B2B223JD)	22K Ω , \pm 5%, 1/8W	
R187	Var, MF, (RJ-6P 10K Ω)	10K Ω , 1/2W	
R188	MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R189	MF, (RM73B2B153JD)	15K Ω , \pm 5%, 1/8W	
R190	MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R191	Not assigned		
R192	Not assigned		
R193	MF, (RM73B2B822JD)	8.2K Ω , \pm 5%, 1/8W	
R194	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R195	MF, (RM73B2B822JD)	8.2K Ω , \pm 5%, 1/8W	
R196	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R197	Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W	
R198	MF, (RM73B2B822JD)	8.2K Ω , \pm 5%, 1/8W	
R199	MF, (RM73B2B562JD)	5.6K Ω , \pm 5%, 1/8W	
R200	Var, MF, (RJ-6P 10K Ω)	10K Ω , 1/2W	
R201	MF, (RM73B2B222JD)	2.2K Ω , \pm 5%, 1/8W	
R202	MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	
R203	Var, MF, (RJ-6P 2K Ω)	2K Ω , 1/2W	
R204	Var, MF, (RJ-6P 2K Ω)	2K Ω , 1/2W	
R205	MF, (RM73B2B472JD)	4.7K Ω , \pm 5%, 1/8W	

() : Manufacturer's part number
 * : Selected at factory

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() : Manufacturer's part number
 * : Selected at factory

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CKT	REF	DESCRIPTION	RATING	NOTE
R206		MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W	
R207		Var, MF, (RJ-6P 10K Ω)	10K Ω , 1/2W	
R208		MF, (RM73B2B562JD)	5.6K Ω , $\pm 5\%$, 1/8W	
R209		MF, (RM73B2B822JD)	8.2K Ω , $\pm 5\%$, 1/8W	
R210		Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W	
R211		MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W	
R212		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R213		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R214		MF, (RM73B2B682JD)	6.8K Ω , $\pm 5\%$, 1/8W	
R215		MF, (RM73B2B273JD)	27K Ω , $\pm 5\%$, 1/8W	
R216		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R217		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R218		MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W	
R219		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R220		MF, (RM73B2B273JD)	27K Ω , $\pm 5\%$, 1/8W	
R221		MF, (RM73B2B471JD)	470 Ω , $\pm 5\%$, 1/8W	
R222		MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W	
R223		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R224		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R225		MF, (RM73B2B123JD)	12K Ω , $\pm 5\%$, 1/8W	
R226		MF, (RM73B2B273JD)	27K Ω , $\pm 5\%$, 1/8W	

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44W83355

() : Manufacturer's part number
* : Selected at factory

CKT	REF	DESCRIPTION	RATING	NOTE
J 1		Cable, (CNF23-34D-AA40S)		
Q 1		IC, (LN513GA)		
Q 2		IC, (LN513GA)		
Q 3		IC, (LN513GA)		
Q 4		IC, (LN513GA)		
Q 5		IC, (LN513GA)		
Q 6		IC, (LN342GPH)		
Q 7		IC, (LN342GPH)		
Q 8		IC, (LN342GPH)		
Q 9		IC, (LN342GPH)		
Q 10		IC, (LN342GPH)		
S 1		Switch, (KEG10901)		
S 2		Switch, (KEG10901)		
S 3		Switch, (KEG10901)		
S 4		Switch, (KEG10901)		
S 5		Switch, (KEG10901)		
S 6		Toggle, (HL-20NS)		
S 7		Toggle, (HL-20NS)		
S 8		Toggle, (HL-20NS)		

() : Manufacturer's part number
 * : Selected at factory

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REF	DESCRIPTION	RATING	NOTE
C 1	Elect, (CE02C1A470)	47 μ F, \pm 20%, 10V	
C 2	Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	
C 3	Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	
C 4	Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	
C 5	Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	
C 6	Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	
C 7	Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	
C 8	Cer, (CK924F1H104Z)	0.1 μ F, +80/-20%, 50V	
J 1	Pattern		
J 2	Connector, (57LE-20240-27CO- D35H)		
Q 1	IC, (75160A)		
Q 2	IC, (75162A)		
Q 3	IC, (PBD7210C)		
Q 4	IC, (74LS00)		
Q 5	IC, (74LS367A)		
Q 6	IC, (74LS240)		
Q 7	IC, (74LS74A)		
Q 8	IC, (74LS32)		
Q 9	IC, (74LS139)		
R 1	Single in-line array, (IHR-8-103JA)	10K Ω x 8, 1/8W	
S 1	Dip, (BP-8)		

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* : Selected at factory

() : Manufacturer's part number

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REF	DESCRIPTION	RATING	NOTE
CKT			
C 1	Elect, (CE02C1A470)	47 μ F, \pm 20%, 10V	
C 2	Elect, (CE02C1C330)	33 μ F, \pm 20%, 16V	
C 3	Elect, (CE02C1C330)	33 μ F, \pm 20%, 16V	
C 4	Cer, (CC924CH1H151J)	150pF, \pm 5%, 50V	
C 5	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
C 6	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
C 7	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
C 8	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
C 9	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
C 10	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
C 11	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
C 12	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
C 13	Cer, (CK924F1H104Z)	0.1 μ F, \pm 80/-20%, 50V	
J 1	Pattern Connector,		
J 2	(DB-25SA-J4)		
Q 1	IC, (SN75189AN)		
Q 2	IC, (74LS240)		
Q 3	IC, (SN75188N)		
Q 4	IC, (UPD8251AFC)		
Q 5	IC, (74LS04)		
Q 6	IC, (74LS367A)		
Q 7	IC, (COM8146)		
Q 8	IC, (74LS139)		
R 1	Single in-line array, (IHR-8-103JA)	10K Ω x 8, 1/8W	
R 2	Single in-line array, (IHR-4-103JA)	10K Ω x 4, 1/8W	
S 1	Dip, (S-2031)		
S 2	Dip, (B-8A)		
X 1	XTAL OSC, (NX-5068)	5.0688MHz	

() : Manufacturer's part number * : Selected at factory

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CKT	REF	DESCRIPTION	RATING	NOTE
G 1		Fan, (FBP-06B-12L)		
J 1		Connector, (PI011-03F)		
J 2		Connector, (HIF3BA5B-34D-AA46S)		
J 3		Connector, (NM11-2F)		
J 4		Connector, (NM11-2F)		
J 5		Connector, (NM11-2F)		
J 6		Connector, (NM11-2F)		
J 7		Not assigned		
J 8		Not assigned		
J 9		Connector, (HRM-208B)		
J 10		Not assigned		
J 11		Connector, (HRM-208B)		
J 12		Connector, (NM27-2F)		
J 13		Connector, (NM27-2F)		
J 14		Connector, (HRM556S)		
J 15		Connector, (HRM556S)		
J 16		Connector, (BNC-PJ2-NI)		
J 17		Not assigned		
J 18		Connector, (BNC-PJ2-NI)		
Z 1		DEMUX		44W83357
Z 2		CLOCK DELAY		44W83358
Z 3		CONTROL		44W83352
Z 4		POWER SUPPLY		44W83353
Z 5		MOTHER BOARD		44W83354
Z 6		DISPLAY		44W83355
Z 7		Not assigned		
Z 8		Not assigned		
Z 9		Not assigned		
Z 10		Not assigned		
Z 11		Not assigned		
Z 12		Not assigned		
Z 13		GP-IB		44W83046
Z 14		RS-232C		44W83047

CKT	REF	DESCRIPTION	RATING	NOTE
C 1		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C 2		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C 3		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C 4		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C 5		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C 6		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C 7		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C 8		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C 9		to	0.047 μ F, \pm 10%, 50V	
C23		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C24		Not assigned		
C25		Not assigned		
C26		to	0.047 μ F, \pm 10%, 50V	
C36		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C37		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C38		to	0.047 μ F, \pm 10%, 50V	
C53		Not assigned		
C54		Not assigned		
C55		Not assigned		
C56		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C57		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C58		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C59		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C60		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C61		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C62		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C63		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C64		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C65		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C66		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C67		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C68		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C69		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C70		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C71		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C72		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C73		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C74		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C75		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C76		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C77		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	
C78		Cer, (CK733B1H473K)	0.047 μ F, \pm 10%, 50V	
C79		Cer, (CK732B1H102K)	1000pF, \pm 10%, 50V	

() : Manufacturer's part number
 * : Selected at factory

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Parts List : Z2 CLOCK DELAY

() : Manufacturer's part number
 * : Selected at factory

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CKT	REF	DESCRIPTION	RATING	NOTE
C80		Tant, (CS734E1V475M)	4.7 μ F, $\pm 20\%$, 35V	
C81		Elect, (CE04W1E470)	47 μ F, $\pm 20\%$, 25V	
C82		Elect, (CE04W1E470)	47 μ F, $\pm 20\%$, 25V	
C83		Elect, (CE04W1A470)	47 μ F, $\pm 20\%$, 10V	
C84		Elect, (CE04W1A470)	47 μ F, $\pm 20\%$, 10V	
C85		Not assigned		
C86		Not assigned		
C87		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C88		Cer, (CK733B1H473K)	0.047 μ F, $\pm 10\%$, 50V	
C89		Tant, (CS732E1A475M)	4.7 μ F, $\pm 20\%$, 10V	
C90		Cer, (CK733B1H473K)	0.047 μ F, $\pm 20\%$, 50V	
C91		Tant, (CS732E1A475M)	4.7 μ F, $\pm 20\%$, 10V	
J 1		Pattern		
J 2		Connector, (HRM100-32S)		
J 3		Connector, (HRM100-32S)		
M 1		Timer, (TM-O)		
Q 1		Dt, breakdown, (RD2.7MB)	2.5 to 2.9V, 200mW	
Q 2		IC, (ND587T-3B)		
Q 3		Dt, (1S2837)		
Q 4		Tr, (2SK406)		
Q 5		IC, (ND587T-3B)		
Q 6		Tr, (2SK406)		
Q 7		IC, (PPB581C)		
Q 8		IC, (PPA102G)		
Q 9		IC, (PPA102G)		
Q10		Not assigned		
Q11		Not assigned		
Q12		Tr, (2SK406)		
Q13		Dt, breakdown, (RD2.7MB)	2.5 to 2.9V, 200mW	
Q14		Tr, (2SK406)		
Q28		to (IDSS 50-65)		

() : Manufacturer's part number
* : Selected at factory

CKT	REF	DESCRIPTION	RATING	NOTE
Q29		Not assigned		
Q30		Not assigned		
Q31		IC, (uPC1251C)		
Q32		Tr, (2SA1154)		
Q33		IC, (uPC177C)		
Q34		IC, (uPC177C)		
Q35		IC, (uPC177C)		
Q36		IC, (uPC177C)		
Q37		IC, (74LS154)		
Q38		IC, (74LS30)		
Q39		IC, (74LS30)		
Q40		IC, (74LS04)		
Q41		Tr, (2SD882)		
Q42		Tr, (2SD882)		
Q43		IC, (uPC1251C)		
R1		MF, (NRTF1/4C1000J)	100Ω, ±5%, 1/4W	
R2		MF, (NRTF1/4C1000J)	100Ω, ±5%, 1/4W	
R3		MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	
R4		MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	
R5		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	
R6		MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	
R7		Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	
R8		Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	
R9		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R10		MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	
R11		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R12		MF, (RM73B2B101JD)	100Ω, ±5%, 1/8W	
R13		MF, (RM73B2B105JD)	1MΩ, ±5%, 1/8W	
R14		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R15		Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	
R16		MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	
R17		MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	
R18		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	
R19		MF, (RM73B2B121JD)	120Ω, ±5%, 1/8W	
R20		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	
R21		MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	
R22		MF, (RM73B2B272JD)	2.7KΩ, ±5%, 1/8W	
R23		MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	
R24		Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	
R25		MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	
R26		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	
R27		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R28		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R29		MF, (RM73B2B390JD)	39Ω, ±5%, 1/8W	
R30		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	

NOTE

RATING

DESCRIPTION

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* : Selected at factory

() : Manufacturer's part number

REF	CKT	DESCRIPTION	RATING	NOTE
R31		MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R32		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R33		MF, (RM73B2B471JD)	470 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R34		MF, (RM73B2B681JD)	680 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R35		MF, (RM73B2B101JD)	100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R36		MF, (RM63B2B330JD)	33 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R37		Not assigned		Q'ty 1 or 1, *
R38		Not assigned		Q'ty 1 or 1, *
R39		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	Q'ty 1 or 1, *
R40		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R41		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R42		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R43		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R44		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R45		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R46		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R47		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R48		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R49		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R50		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R51		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R52		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R53		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R54		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R55		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R56		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	Q'ty 1 or 1, *
R57		MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R58		MF, (RM73B2B102JD)	1K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R59		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R60		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R61		Var, MF, (RJ-6P 500 Ω)	500 Ω , 1/2W	Q'ty 1 or 1, *
R62		Var, MF, (RJ-6P 500 Ω)	500 Ω , 1/2W	Q'ty 1 or 1, *
R63		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R64		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R65		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R66		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R67		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R68		MF, (RM73B2B510JD)	51 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R69		MF, (RM73B2B560JD)	56 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R70		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R71		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R72		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R73		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R74		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *
R75		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	Q'ty 1 or 1, *

* : Selected at factory

() : Manufacturer's part number

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REF	CKT	DESCRIPTION	RATING	NOTE
R76		MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	
R77		MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R78		MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	
R79		MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R80		MF, (RM73B2B560JD)	56Ω, ±5%, 1/8W	
R81		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R82		MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R83		MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R84		MF, (RM73B2B * JD)	0 to 220Ω, ±5%, 1/8W	
R85		MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R86		Var, MF, (RJ-6P 1kΩ)	1kΩ, 1/2W	
R87		Not assigned		
R88		Not assigned		
R89		to		
R99		Var, MF, (RJ-6P 500Ω)	500Ω, 1/2W	
R100		Var, MF, (RJ-6P 2kΩ)	2kΩ, 1/2W	
R101		MF, (RM73B2B222JD)	2.2kΩ, ±5%, 1/8W	
R102		MF, (RM73B2B222JD)	2.2kΩ, ±5%, 1/8W	
R103		MF, (RM73B2B222JD)	2.2kΩ, ±5%, 1/8W	
R104		MF, (RM73B2B101JD)	100Ω, ±5%, 1/8W	
R105		MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	
R106		MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	
R107		MF, (RM73B2B222JD)	2.2kΩ, ±5%, 1/8W	
R108		MF, (RM73B2B822JD)	8.2kΩ, ±5%, 1/8W	
R109		to		
R119		MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	
R120		MF, (RM73B2B562JD)	5.6kΩ, ±5%, 1/8W	
R121		Var, MF, (RJ-6P 1kΩ)	1kΩ, 1/2W	
R122		Not assigned		
R123		Not assigned		
R124		MF, (RM73B2B822JD)	8.2kΩ, ±5%, 1/8W	
R125		MF, (RM73B2B102JD)	1kΩ, ±5%, 1/8W	
R126		MF, (RM73B2B105JD)	1MΩ, ±5%, 1/8W	
R127		Single in-line array, (IHR-7-152JB)	1.5kΩ x 7, 1/8W	
R128		Single in-line array, (IHR-7-152JB)	1.5kΩ x 7, 1/8W	
R129		Single in-line array, (IHR-7-332JA)	3.3kΩ x 7, 1/8W	
R130		Single in-line array, (IHR-7-332JA)	3.3kΩ x 7, 1/8W	
R131		MF, (RM73B2B273JD)	27kΩ, ±5%, 1/8W	
R132		MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	

Qty 1 or 1, *

Qty 1 or 1, *

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() : Manufacturer's part number
* : Selected at factory

CKT	REF	DESCRIPTION	RATING	NOTE
R133		MF, (RM73B2B103JD)	100Ω, ±5%, 1/8W	
R134		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R135		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R136		MF, (RM73B2B273JD)	27KΩ, ±5%, 1/8W	
R137		MF, (RM73B2B682JD)	6.8KΩ, ±5%, 1/8W	
R138		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R139		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R140		MF, (RM73B2B101JD)	100Ω, ±5%, 1/8W	

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* : Selected at factory

() : Manufacturer's part number

CKT	REF	DESCRIPTION	RATING	NOTE
C55		Not assigned		
C56		Not assigned		
C57		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C58		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C59		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C60		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C61		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C62		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C63		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C64		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C65		Cer, (CK732BH103K)	0.01 μ F, \pm 10%, 50V	
C75		to		
C76		Not assigned		
C77		Not assigned		
C78		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C79		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C80		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C81		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C82		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C83		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C84		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C85		Elect, (CE04W1E470)	47 μ F, \pm 20%, 25V	
C86		Elect, (CE04W1E470)	47 μ F, \pm 20%, 25V	
C87		Elect, (CE04W1A470)	47 μ F, \pm 20%, 10V	
C88		Elect, (CE04W1A470)	47 μ F, \pm 20%, 10V	
C89		Tant, (CS732E1V105M)	1 μ F, \pm 20%, 35V	
C90		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C91		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C92		Tant, (CS732E1V105M)	1 μ F, \pm 20%, 35V	
C93		Not assigned		
C94		Not assigned		
C95		Not assigned		
C96		to		
C110		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C111		Not assigned		
C112		Not assigned		
C113		Tant, (CS732E1V105M)	1 μ F, \pm 20%, 35V	
C114		Cer, (CK733BH473K)	0.047 μ F, \pm 10%, 50V	
C115		Cer, (CK732BH103K)	0.01 μ F, \pm 10%, 50V	
J 1		Pattern		
J 2		Connector, (HRM100-32S)		
J 3		Not assigned		

CKT	REF	DESCRIPTION	RATING	NOTE
J 4		Connector, (HRM100-32S)		
J 5		Connector, (HRM100-32S)		
J 6		Connector, (HRM100-32S)		
K 1		Relay, (RA30201121)		
K 2		Relay, (RA30201121)		
K 3		Relay, (712-12)		
L 1		Coil, (442T56877)		
Q 1		IC, (uPC1251C)		
Q 2		IC, (uPC451C)		
Q 3		IC, (uPC1251C)		
Q 4		DI, (1S2837)		
Q 5		Tr, (2SC3584)		
Q 6		Tr, (2SK406 (IDSS 50-65))		
Q 7		Tr, (2SK406 (IDSS 50-65))		
Q 8		IC, (ND587T-3B)		
Q 9		DI, breakdown, (RD2.7MB)		
Q 10		D, (1S2835)		
Q 11		Tr, (2SK406 (IDSS 50-65))		
Q 12		Tr, (2SK406 (IDSS 50-65))		
Q 13		Tr, (2SK406 (IDSS 50-65))		
Q 14		Tr, (2SK406 (IDSS 50-65))		
Q 15		Tr, (2SK406 (IDSS 50-65))		
Q 16		Tr, (2SK406 (IDSS 50-65))		
Q 17		Tr, (2SK406 (IDSS 50-65))		
Q 18		IC, (uPC1251C)		
Q 19		IC, (uPC1251C)		
Q 20		IC, (uPC1251C)		
Q 21		IC, (uPC451C)		
Q 22		DI, (1S953)		
Q 23		IC, (HD75451AP)		
Q 24		Not assigned		
Q 25		Not assigned		
Q 26		DI, (1S953)		
Q 27		DI, (1S2835)		
Q 28		IC, (uPA102G)		
Q 29		DI, (1S2835)		
Q 30		IC, (uPA102G)		
Q 31		IC, (10G021AL (2GHZ))		
Q 32		Tr, (2SK406 (IDSS 50-65))		

2.5 to 2.9V, 200mW

() : Manufacturer's part number
 * : Selected at factory

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* : Selected at factory

() : Manufacturer's part number

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REF	DESCRIPTION	RATING	NOTE
Q33	Tr, (2SK406 (IDSS 50-65))		
Q34	IC, (μPC451C)		
Q35	D1, (1S2835)		
Q36	Tr, (2SA1154)		
Q37	Tr, (2SA1154)		
Q38	IC, (μPC1251C)		
Q39	Not assigned		
Q40	Not assigned		
Q41	Tr, (2SK406 (IDSS 50-65))		
Q42	Tr, (2SK406 (IDSS 50-65))		
Q43	Tr, (2SK406 (IDSS 50-65))		
Q44	Tr, (2SK406 (IDSS 50-65))		
Q45	Tr, (2SK406 (IDSS 50-65))		
Q46	IC, (μPC1251C)		
Q47	Tr, (2SA1154)		
R1	MF, (RM73B2B562JD)	5.6kΩ, ±5%, 1/8W	
R2	Var, MF, (RJ-6P 5kΩ)	5kΩ, 1/2W	
R3	Var, MF, (RJ-6P 1kΩ)	1kΩ, 1/2W	
R4	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R5	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R6	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R7	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R8	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R9	MF, (RM73B2B682JD)	6.8kΩ, ±5%, 1/8W	
R10	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R11	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R12	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R13	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R14	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R15	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R16	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R17	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R18	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	
R19	MF, (RM73B2B472JD)	4.7kΩ, ±5%, 1/8W	
R20	MF, (RM73B2B562JD)	5.6kΩ, ±5%, 1/8W	
R21	Var, MF, (RJ-6P 1kΩ)	1kΩ, 1/2W	
R22	Var, MF, (RJ-6P 5kΩ)	5kΩ, 1/2W	
R23	Var, MF, (RJ-6P 1kΩ)	1kΩ, 1/2W	
R24	Var, MF, (RJ-6P 5kΩ)	5kΩ, 1/2W	
R25	Var, MF, (RJ-6P 5kΩ)	5kΩ, 1/2W	
R26	Var, MF, (RJ-6P 1kΩ)	1kΩ, 1/2W	
R27	MF, (RM73B2B562JD)	5.6kΩ, ±5%, 1/8W	
R28	MF, (RM73B2B103JD)	10kΩ, ±5%, 1/8W	

REF	DESCRIPTION	RATING	NOTE
R74	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Qty 1 or 1, *
R75	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	Qty 1 or 1, *
R76	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R77	MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R78	MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Qty 1 or 1, *
R79	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R80	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R81	MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R82	Not assigned		
R83	Not assigned		
R84	Not assigned		
R85	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R86	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R87	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R88	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R89	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R90	MF, (RM73B2B562JD)	5.6KΩ, ±5%, 1/8W	
R91	Var, MF, (RJ-6P 5KΩ)	5KΩ, 1/2W	
R92	Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	
R93	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R94	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R95	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R96	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R97	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R98	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R99	Var, MF, (RJ-6P 5KΩ)	5KΩ, 1/2W	
R100	Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	
R101	Not assigned		
R102	Not assigned		
R103	Not assigned		
R104	Var, MF, (RJ-6P 5KΩ)	5KΩ, 1/2W	
R105	Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	
R106	MF, (RM73B2B562JD)	5.6KΩ, ±5%, 1/8W	
R107	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R108	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R109	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R110	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R111	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R112	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R113	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R114	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R115	MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R116	MF, (RM73B2B472JD)	4.7KΩ, ±5%, 1/8W	
R117	MF, (RM73B2B562JD)	5.6KΩ, ±5%, 1/8W	
R118	Var, MF, (RJ-6P 5KΩ)	5KΩ, 1/2W	

CKT	REF	DESCRIPTION	RATING	NOTE
R119		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R120		Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W	
R121		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R122		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R123		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R124		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R125		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R126		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R127		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R128		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R129		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R130		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R131		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R132		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R133		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R134		Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W	
R135		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R136		Not assigned		
R137		Not assigned		
R138		Not assigned		
R139		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R140		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R141		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R142		MF, (RM73B2B103JD)	10K Ω , $\pm 5\%$, 1/8W	
R143		MF, (RM73B2B472JD)	4.7K Ω , $\pm 5\%$, 1/8W	
R144		Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W	
R145		Var, MF, (RJ-6P 5K Ω)	5K Ω , 1/2W	
R146		MF, (RM73B2B222JD)	2.2K Ω , $\pm 5\%$, 1/8W	
R147		MF, (RM73B2B151JD)	150 Ω , $\pm 5\%$, 1/8W	
R148		MF, (RM73B2B151JD)	150 Ω , $\pm 5\%$, 1/8W	
R149		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R150		MF, (RM73B2B331JD)	330 Ω , $\pm 5\%$, 1/8W	
R151		MF, (RM73B2B510JD)	510 Ω , $\pm 5\%$, 1/8W	
R152		MF, (RM73B2B * JD)	0 to 220 Ω , $\pm 5\%$, 1/8W	Qty 1 or 1, *
R153		MF, (RM73B2B330JD)	330 Ω , $\pm 5\%$, 1/8W	
R154		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Qty 1 or 1, *
R155		MF, (RM73B2B180JD)	180 Ω , $\pm 5\%$, 1/8W	
R156		MF, (RM73B2B820JD)	820 Ω , $\pm 5\%$, 1/8W	
R157		MF, (RM73B2B330JD)	330 Ω , $\pm 5\%$, 1/8W	
R158		MF, (RM73B2B * JD)	0 to 100 Ω , $\pm 5\%$, 1/8W	Qty 1 or 1, *
R159		MF, (RM73B2B180JD)	180 Ω , $\pm 5\%$, 1/8W	
R160		Var, MF, (RJ-6P 1K Ω)	1K Ω , 1/2W	
R161		MF, (RM73B2B331JD)	330 Ω , $\pm 5\%$, 1/8W	
R162		MF, (RM73B2B510JD)	510 Ω , $\pm 5\%$, 1/8W	
R163		MF, (RM73B2B * JD)	0 to 221 Ω , $\pm 5\%$, 1/8W	Qty 1 or 1, *

() : Manufacturer's part number
 * : Selected at factory

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Parts List : Z1 DEMUX

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 () : Manufacturer's part number
 * : Selected at factory

REF	DESCRIPTION	RATING	NOTE
R164	MF, (RM73B2B330JD)	330, ±5%, 1/8W	Q'ty 1 or 1, *
R165	MF, (RM73B2B * JD)	0 to 1000, ±5%, 1/8W	Q'ty 1 or 1, *
R166	MF, (RM73B2B180JD)	180, ±5%, 1/8W	
R167	MF, (RM73B2B820JD)	820, ±5%, 1/8W	
R168	MF, (RM73B2B330JD)	330, ±5%, 1/8W	Q'ty 1 or 1, *
R169	MF, (RM73B2B * JD)	0 to 1000, ±5%, 1/8W	Q'ty 1 or 1, *
R170	MF, (RM73B2B180JD)	180, ±5%, 1/8W	
R171	Not assigned		
R172	Not assigned		
R173	Not assigned		
R174	MF, (RM73B2B510JD)	510, ±5%, 1/8W	
R175	MF, (RM73B2B510JD)	510, ±5%, 1/8W	
R176	MF, (RM73B2B510JD)	510, ±5%, 1/8W	
R177	MF, (RM73B2B510JD)	510, ±5%, 1/8W	
R178	MF, (RM73B2B * JD)	0 to 4700, ±5%, 1/8W	Q'ty 1 or 1, *
R179	MF, (RM73B2B * JD)	0 to 4700, ±5%, 1/8W	Q'ty 1 or 1, *
R180	MF, (RM73B2B472JD)	4.7k0, ±5%, 1/8W	
R181	MF, (RM73B2B * JD)	0 to 2200, ±5%, 1/8W	Q'ty 1 or 1, *
R182	MF, (RM73B2B * JD)	0 to 2200, ±5%, 1/8W	Q'ty 1 or 1, *
R183	MF, (RM73B2B472JD)	4.7k0, ±5%, 1/8W	Q'ty 1 or 1, *
R184	MF, (RM73B2B103JD)	10k0, ±5%, 1/8W	
R185	MF, (RM73B2B103JD)	10k0, ±5%, 1/8W	
R186	MF, (RM73B2B * JD)	0 to 1000, ±5%, 1/8W	Q'ty 1 or 1, *
R187	MF, (RM73B2B510JD)	510, ±5%, 1/8W	
R188	Not assigned		
R189	Not assigned		
R190	Not assigned		
R191	Var, MF, (RJ-6P 1000)	1000, 1/2W	
R192	MF, (RM73B2B331JD)	3300, ±5%, 1/8W	
R193	MF, (RM73B2B470JD)	470, ±5%, 1/8W	
R194	MF, (RM73B2B101JD)	1000, ±5%, 1/8W	
R195	MF, (RM73B2B102JD)	1k0, ±5%, 1/8W	
R196	MF, (RM73B2B101JD)	1000, ±5%, 1/8W	
R197	MF, (RM73B2B332JD)	3.3k0, ±5%, 1/8W	
R198	MF, (RM73B2B472JD)	4.7k0, ±5%, 1/8W	
R199	MF, (RM73B2B101JD)	1000, ±5%, 1/8W	
R200	MF, (RM73B2B102JD)	1k0, ±5%, 1/8W	
R201	MF, (RM73B2B470JD)	470, ±5%, 1/8W	
R202	MF, (RM73B2B181JD)	1800, ±5%, 1/8W	
R203	Not assigned		
R204	Not assigned		
R205	Not assigned		
R206	Not assigned		
R207	MF, (RM73B2B * JD)	100 to 4700, ±5%, 1/8W	Q'ty 1 or 1, *
R208	Var, MF, (RJ-6P 1k0)	1k0, 1/2W	

CKT	REF	DESCRIPTION	RATING	NOTE
R209		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or 1, *
R210		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	Q'ty 1 or 1, *
R211		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	Q'ty 1 or 1, *
R212		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	Q'ty 1 or 1, *
R213		Not assigned		Q'ty 1 or 1, *
R214		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or 1, *
R215		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	Q'ty 1 or 1, *
R216		Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	Q'ty 1 or 1, *
R217		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or 1, *
R218		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	Q'ty 1 or 1, *
R219		Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	Q'ty 1 or 1, *
R220		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	Q'ty 1 or 1, *
R221		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	Q'ty 1 or 1, *
R222		Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	Q'ty 1 or 1, *
R223		MF, (RM73B2B * JD)	100 to 472Ω, ±5%, 1/8W	Q'ty 1 or 1, *
R224		Not assigned		
R225		Not assigned		
R226		Not assigned		
R227		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R228		MF, (RM73B2B * JD)	0 to 100Ω, ±5%, 1/8W	
R229		MF, (RM73B2B103JD)	10KΩ, ±5%, 1/8W	
R230		Var, MF, (RJ-6P 1KΩ)	1KΩ, 1/2W	
R231		MF, (RM73B2B220JD)	22Ω, ±5%, 1/8W	
R232		Not assigned		
R233		MF, (RM73B2B510JD)	51Ω, ±5%, 1/8W	
R234		MF, (RM73B2B102JD)	1KΩ, ±5%, 1/8W	
R235		MF, (RM73B2B101JD)	100Ω, ±5%, 1/8W	
R236		MF, (RM73B2B222JD)	2.2KΩ, ±5%, 1/8W	
R237		MF, (RM73B2B332JD)	3.3KΩ, ±5%, 1/8W	
R238		Var, MF, (RJ-6P 2KΩ)	2KΩ, 1/2W	

() : Manufacturer's part number
 * : Selected at factory

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() : Manufacturer's part number
* : Selected at factory
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CKT	REF	DESCRIPTION	RATING	NOTE
J 1		Cable, (CNF23-34D-AA40S)		
Q 1		IC, (LN513GA)		
Q 2		IC, (LN513GA)		
Q 3		IC, (LN513GA)		
Q 4		IC, (LN513GA)		
Q 5		IC, (LN513GA)		
Q 6		IC, (LN513GA)		
Q 7		IC, (LN513GA)		
Q 8		IC, (LN513GA)		
Q 9		IC, (LN513GA)		
Q 10		IC, (LN513GA)		
Q 11		IC, (LN342GPH)		
Q 12		IC, (LN342GPH)		
Q 13		IC, (LN345GPH)		
S 1		Switch, (KEG10901)		
S 2		Switch, (KEG10901)		
S 3		Switch, (KEG10901)		
S 4		Switch, (KEG10901)		
S 5		Switch, (KEG10901)		
S 6		Switch, (KEG10901)		
S 7		Switch, (KEG10901)		
S 8		Switch, (KEG10901)		
S 9		Switch, (HL-20NS)		
S 10		Switch, (HL-20NS)		
S 11		Switch, (HL-20LSYG)		

